OHIO STATE UNIVERSITY
OCT 2 1935
LIBRARY
TK1
E38
Y84

ELECTRICAL CONTRACTING

ENGINEERING • INSTALLATION • REPAIRING • MARKETING

OCTOBER
1935

Report of

N. E. C. A.

Convention

held at Chicago

September 23, 24, 25, 1935

UMI

AN INSTRUMENT BUILT FOR THE ELECTRICAL CONTRACTOR

EVERY job for which a contractor needs an electric testing instrument was considered in the design of G-E Type AP-9 instruments.

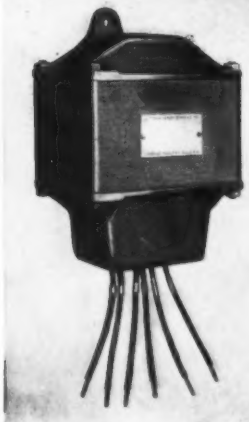
You want portable instruments with a reasonable degree of accuracy and which will stand a lot of rough usage. AP-9 instruments have these features and will give you excellent performance and long-time service.

You should see one to appreciate its good points: Neat and compact; easy to handle and carry; self-ventilated, no holes to let in dust. Cover protects glass and encloses terminals. Clear and distinct scale markings, mirror, and knife-edge pointer, insure quick and accurate readings. Then, when you learn the price, you will agree that it is "a lot of instrument for the money."

A G-E AP-9 150/300-VOLT VOLTMETER

This line includes voltmeters, milliammeters, ammeters, and wattmeters for a-c or d-c. measurements. Size: 2 1/2 by 4 3/4 by 6 1/2 in. Weight: 3 1/2 lb. For details and prices, see Bulletin GEA-1784. Address the nearest G-E distributor, G-E office, or General Electric Company, Dept. 6D-201, Schenectady, New York.

SAVE MONEY FOR YOUR CUSTOMERS WITH THESE G-E TRANSFORMERS



RECOMMEND to your industrial customer that he put all his power load on the power circuit. By doing so, he can save money, where the rate on power circuits is lower.

Such loads as small drills, compressors, fans, soldering irons, etc., do not belong on the lighting circuit but on the power circuit. They can be transferred, easily and inexpensively, by installing small G-E air-cooled transformers.

These G-E air-cooled transformers are available for practically any application where a special voltage of 600 or less is required. They are small, compact, easily installed, require no fireproof vault, and are neat in appearance.

This is profitable business for you; why not cash in on it now?

430-55

SPECIFY G-E INSULATED CABLE

YOUR customers will always be satisfied when you recommend G-E insulated cable. Every type has a good reputation for reliability.

You can get it in every type, size, and voltage for every application. Shipments can be made promptly because many sizes are carried in stock. See the G-E distributor nearest you.

A new publication just issued will be helpful to you in selecting the right type of rubber-insulated cable. It is GEA-2133, "Cable Compounds." For a copy address the nearest G-E sales office, or General Electric Company, Dept. 6—201, Schenectady, N. Y.

GENERAL ELECTRIC

UMI

S. B. WILLIAMS
Editor
F. J. SEILER
Assistant Editor

HOWARD EHRLICH
President
GLENN SUTTON
Manager

ELECTRICAL CONTRACTING

Vol. 34 OCTOBER - 1935 No. 12

Established 1901
Official Publication
of the
National Electrical
Contractors Association

INSTALLATION
ENGINEERING
MAINTENANCE
REPAIRING
MANAGEMENT
MARKETING

for

ELECTRICAL CONTRACTORS
INDUSTRIAL
COMMERCIAL
RESIDENTIAL

ELECTRICAL INSPECTORS
ENGINEERS
SERVICE SHOPS

and others engaged in the business of electrical construction

MAIN LIBRARY C

CONTENTS

N. E. C. A. Convention Report

First N.E.C.A. Convention in Three Years 6
Code Regulation of Industry, *By L. E. Mayer* 10
Voluntary Agreements, *By W. W. Ingalls* 11
Wiring Policy, *By E. N. Peak* 12
Range Merchandising and Wiring, *By F. T. Langford* 13
The Future of Our Industry, *By D. W. Tracy* 14
A Plan to Rebuild N.E.C.A., *By R. M. Walker* 15
Fundamentals of State Licensing Legislation 16
Rules for the Building Game, *By E. S. Hall* 17
Adequate Wiring Manual 17

Mechanical Stator Stripping 18

A Large Pari-Mutuel Installation 19

DEPARTMENTS

Construction Methods 20
Service Shop Practice 28
Editorials 38
Contracting News 40
Roll O'Tape 46
New Products 49
Manufacturers' Bulletins 51

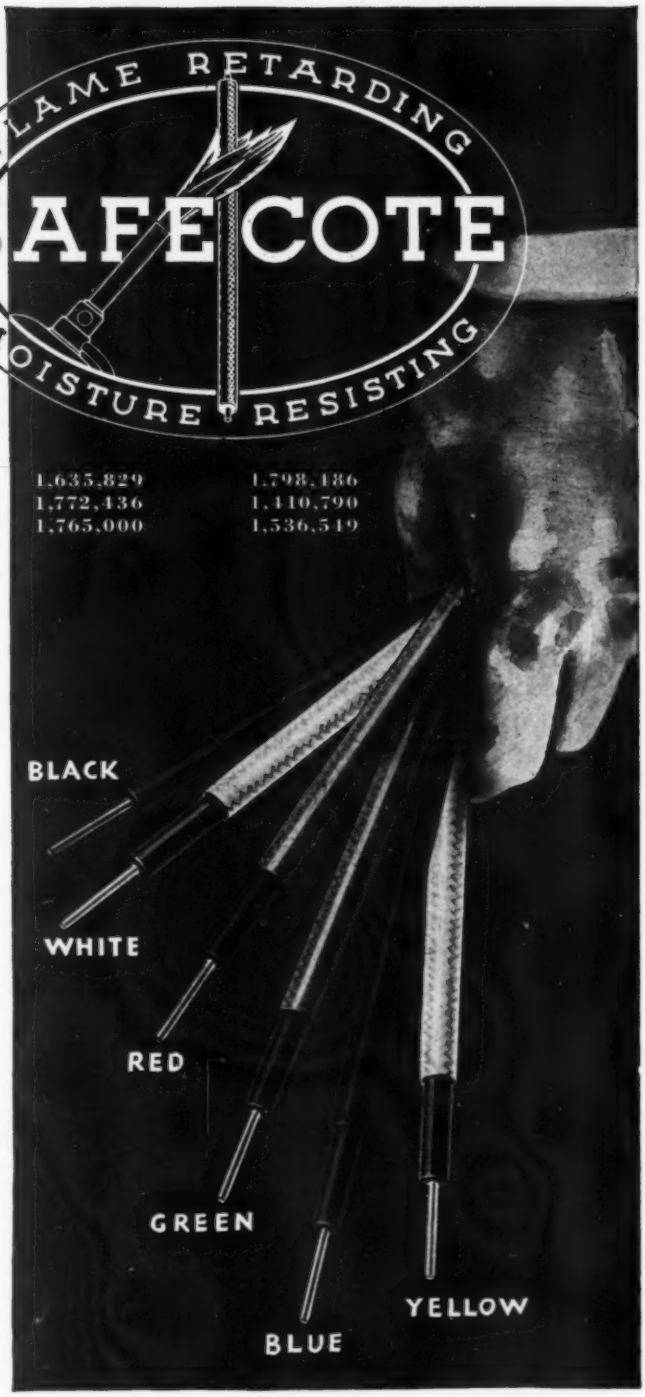
Advertisers' Index 52

Published Monthly by
The Electrical Trade Publishing Co., 330 West 42d Street, New York
520 North Michigan Ave., Chicago **501 Guardian Building, Cleveland**

Member Associated Business Papers, Inc., and Audit Bureau of Circulations. Also Publishers of Mill Supplies and Electrical Wholesaling. Subscription: U. S. $2; Canada, $2.50, including duty. All other countries, $2.50 per year. Single copies 25 cents. Entered as second class matter February 20th, 1935, at the post office at New York, N. Y., under the Act of March 3, 1879. Copyright 1935—Electrical Trade Publishing Co.

UMI

SAFECOTE WIRE *Performance* depends upon its INSULATION



Rubber insulation by the world's largest producer of rubber is your best guarantee for maximum performance.

U. S. Safecote wire is made in all sizes; in colors for circuit identification.

United States Rubber Products, Inc.
1790 Broadway, New York
Stocks in All Industrial Centers

1935 is the 25th anniversary of "U.S." Rubber plantations in the Far East. And the crude rubber production of "U.S." is now more than three times the combined output of all other American rubber companies combined. Controlled quality from the rubber tree, to the finished product, assures extra value and extra performance for the user.

UNITED STATES RUBBER COMPANY — US — TRADE MARK

United States Rubber Company

UMI

OCTOBER 1935

Engineering

THERE was a time not so very many years ago when the wiring of even a large building involved little or no engineering, because the loads were small and the manner of using service was somewhat limited. Today, however, there is hardly a contractor doing any substantial volume of business who does not employ an engineering staff.

HEAVIER loads, use diversification, the need for greater distribution and energy economies, new developments in lighting, sound, low-tension equipment, photronic control, ventilation and air conditioning have made engineering of increasing importance to the electrical contractor. And because his work covers virtually all fields of industrial activities, he has gradually had to become to some degree an industrial engineer. He is designing new production flow, studying machine output costs, devising new ways to speed up work and minimize waste.

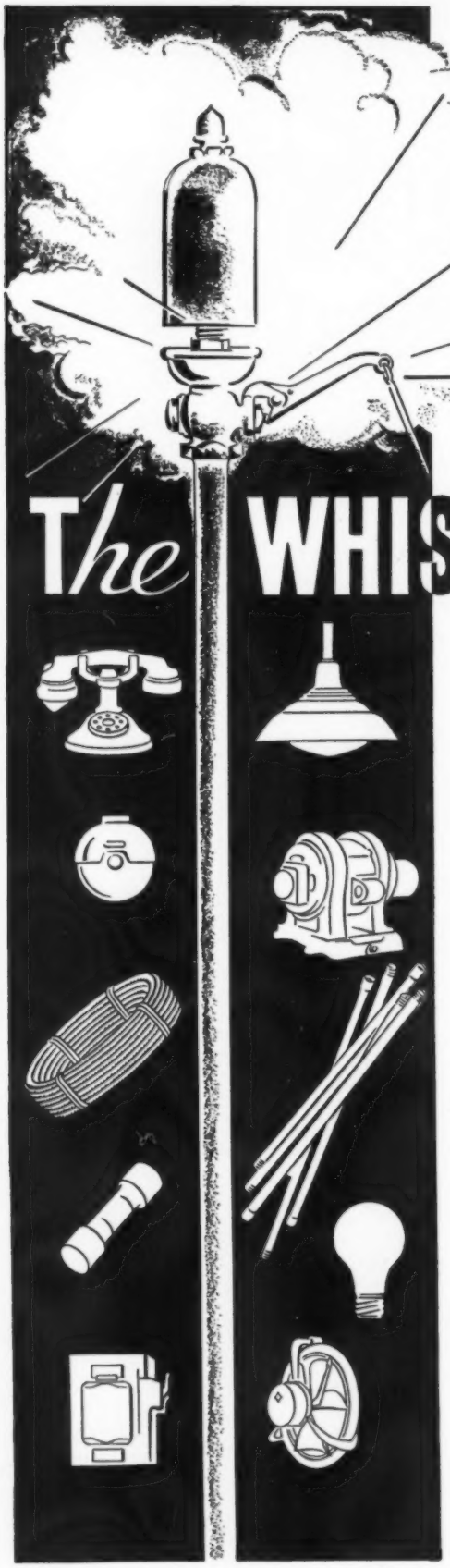
EVEN in the residential field we find engineering at work to devise more economical yet effective ways to provide adequate wiring, conveniently controlled. We find the new type of fireproof house suggesting new wiring designs.

EACH year the wiring and electrical requirements of buildings become more complicated—with the result that engineering is becoming increasingly important.

BECAUSE of this trend, ELECTRICAL CONTRACTING has made engineering one of the four major elements of its editorial program. It involves not only the calculations of loads and sizes, but the selection of the right materials and equipment. As the usage of electricity has expanded, the devices of utilization have grown more numerous, and more highly specialized. This one factor alone, material and equipment selection, requires more engineering skill and is a responsibility which the electrical contractor must assume to a greater and greater degree.

BY SHOWING what others are doing, by analyzing the uses of various types of equipment, by descriptions of new methods and product development and in numerous other ways, ELECTRICAL CONTRACTING will strive to do its part to contribute to the advancement of engineering on the part of electrical contractors.

UMI



The WHISTLE'S BLOWING!

... *it means business for* CONTRACTORS!

Slowly . . . steadily . . . Industry is mobilizing for recovery! Industry will need motors, wire and conduit, electrical work. That means business—for somebody.

To alert contractors, it means even more than that. It means new selling opportunities—opportunities to turn what would be small orders into real sales. But it's up to the contractor.

He can show prospects that industrial efficiency is the only road to industrial *profits* in an era of rising costs. He can show how electrical modernization can increase that efficiency.

He can sell signal systems by showing how they save time . . . energy . . . money. He can sell better lighting as a means to increase production per man. He can sell re-wiring . . . motors and control.

When he does he will be making profitable work for himself. And if he sticks to *quality* in materials . . . the Graybar kind of quality . . . he will be making a reputation that will be bound to grow in the years to come.

GraybaR

ELECTRIC COMPANY

OFFICES IN 77 PRINCIPAL CITIES: *Executive Offices*, GRAYBAR BLDG., NEW YORK, N. Y.

ELECTRICAL CONTRACTING

Vol. 34 OCTOBER, 1935 No. 12

S. B. Williams, Editor

FIELD BRIEFS

● A CHECK-BACK on old wiring estimates, totaling $33,000 which had been made two and three years ago, was recently conducted by the Clark & Mills Electric Company of Boston and Cambridge, Mass. More than 10 per cent of these jobs were secured, despite the length of time that had ensued since the original proposals had been made.

● AN OUTLET BOX cover made from a tin can with a hole punched through for a drop cord occupies a prominent place on the "Don't Do It" board of City Inspector Lunsford of El Paso, Tex. When the insulation wore off the result was a $1,000 fire. This board has a number of other home made electrical devices of equal economic value to the public.

● EIGHTEEN INDUSTRIES that were undeveloped in 1879 gave employment to 1,123,314 workers fifty years later, according to figures compiled by the National Industrial Conference Board. Leading in this group from the standpoint of average number of wage-earners employed in 1929 is electrical machinery, apparatus and supplies with 328,722.

● ALTHOUGH the new Hershey building at Hershey, Pa., will have no windows the workers will know at all times just what the weather is outdoors by means of an "electric weather man." By means of three colored lighted bull's eyes, seven combinations of colors have been adopted to indicate clear, cloudy, rain, sleet, snow, clear but below 10 deg. F. and clear but above 90.

● ELECTRIC RATE reductions during the year ending June 30, 1935, resulted in an annual saving to consumers of $47,460,618, according to the Electric Rate Survey of the Federal Power Commission. This conclusion was reached from a study of reports covering over 90 per cent of the electrical energy sold in the United States. Rate decreases during this period were put into effect by 480 of the 1,010 private and 270 of the 915 municipal utilities that reported. Over half of the savings benefitted residential consumers. Rate reductions averaged 3.5 per cent of 1933 revenues, divided 4.86 per cent for municipal plants and 3.48 per cent for privately-owned utilities.

Reports received since June 30 from twelve companies announce further reductions amounting to approximately $13,000,000.

● TODAY EUROPE lags far behind America in the use of electricity, especially for home lighting, according to Samuel G. Hibben, Westinghouse Lamp Company, who made a detailed study of manufacturing and lighting practice abroad last year. Only 30 per cent of the homes in England are wired for electricity, according to Mr. Hibben, as compared to some 80 per cent in this country. As an index of lighting progress, the American citizen consumes slightly more than five lamp bulbs per year. The next nation in the order of lamp usage is Denmark, with about 1.75.

UMI

First N. E. C. A. Convention

Peak elected president—Proposed constitution and by-laws voted down—To study new regional membership plan

The New Officers

Earl N. Peak of Marshalltown, Ia., new N.E.C.A. president, and Louis Kalischer (right) of Brooklyn, N. Y., vice-president.

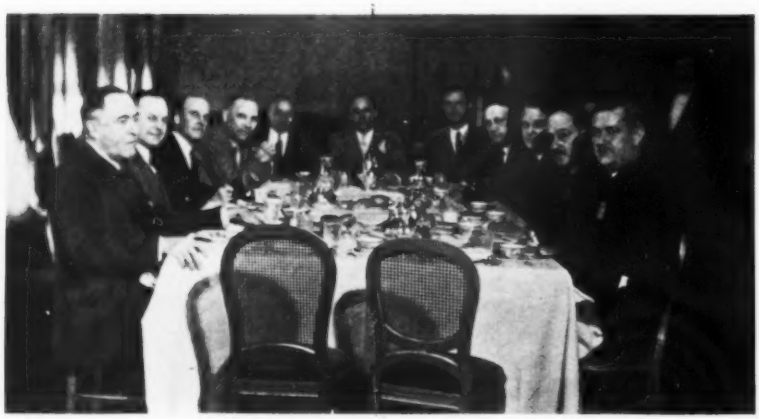
AFTER a lapse of three years, the National Electrical Contractors Association held, at the Hotel LaSalle, Chicago, Illinois, September 23-25, its first annual convention since 1932. Unlike previous conventions, no time was taken off during daylight hours for entertainment or play. The six business sessions had been arranged for a crowded program.

The attendance, while not large, was, if anything, better than had been anticipated. It represented most every section of the country and Canada.

Earl N. Peak, Marshall Electric Company, Marshalltown, Ia., who had been vice-president for the last six years, and a member of the Executive Committee before that, was elected president to succeed L. E. Mayer, who had held the office since 1929. Louis Kalischer of Brooklyn, N. Y., first chairman of the National Motor Section, member of the Executive Committee, and winner of the McGraw Award in 1930 as originator of the industrial electrical modernization program of the New York Electrical Association, was elected vice-president. The new members elected to the Executive Committee are: R. W. McChesney, Washington, D. C., for the Eastern Division; Harry Evans, Kansas City, Mo., for the Central Division; and G. W. Patterson, Toronto, Canada, for the Eastern Canadian Division. The following executive committeemen were reelected: D. B. Clayton, Birmingham, Ala., Southern Division; W. W. Ingalls, Miami, Fla., Southeastern Division; R. J. Nickels, Madison, Wis., Great Lakes Division; R. R. Reid, Salt Lake City, Utah, Mountain Division; Lloyd Flatland, San Francisco, Cal., Pacific Division; and J. H. Schumacher, Winnipeg, Western Canadian Division.

Three past presidents, James R. Strong of New York, W. Creighton Peet of New York, and Colonel Robley S. Stearnes of New Orleans, were elected to honorary membership. All three of these members had retired from the electrical contracting industry during the past few years.

The thirty-third annual convention opened with an address of welcome from W. A. Jackson, former member of the Executive Committee of the Association, and now commissioner of gas and electricity for Chicago, who greeted the convention in the name of Mayor Kelly. After a suitable response by Past President J. A. Fowler, of Memphis, President L. E. Mayer reported on his six years of stewardship of the Association, laying stress upon the necessity for fair trade practice regulation of competition. He was followed by L. W. Davis, general manager of the Association, who presented the secretary and treasurer's report, which showed the current financial condition of the Association, and gave a picture of the membership during the last few years, with reasons for the wide fluctuations. This report



New Officers and Executive Committee

Following their election at the Wednesday morning session, the new officers went into a luncheon executive session. President Earl N. Peak may be seen in the center background with Laurence W. Davis, secretary-treasurer, at the right. Seated to the left of Mr. Peak is Louis Kalischer, the new vice-president, and next in order W. W. Ingalls of Miami, Harry C. Evans of Kansas City, Robt. W. McChesney of Washington, D. C., and R. J. Nickles of Madison, Wis. To the right of and next to Mr. Davis are R. R. Reid of Salt Lake City; Lloyd Flatland of San Francisco; J. H. Schumacher of Winnipeg; and Geo. W. Patterson of Toronto. D. B. Clayton of Birmingham is sitting behind Mr. Schumacher.

UMI

in Three Years

showed a capital reserve of nearly $80,000. The budget has been reduced to a minimum figure of less than $35,000. While this has meant the curtailment of some services, Mr. Davis stated that no essential service has been disrupted, and that the staff and equipment of the National Electrical Contractors Association are designed to economically and efficiently handle the new program and problems which are today facing the industry.

The special committee, headed by W. W. Ingalls of Miami, which was appointed by the Executive Committee to study voluntary agreements for industry self-regulation, made a studied report which will be found elsewhere in this issue. The committee concluded that while several cities now have voluntary agreements, none of them have had sufficient experience to prove their workability, and it was recommended that all such plans be carefully studied, in order that they may be made the basis for self-regulation in other localities, as they prove their soundness. There was a considerable amount of interest manifested in the subject. Representatives from New York City, San Francisco, and Kansas City briefly outlined the agreements under which they were working. It was pointed out that it is now possible to secure a surety bond covering penalties under these agreements, which otherwise would have to be put up in cash.

An explanation of the wiring policy adopted by the Executive Committee at its summer meeting was made by Vice-President Peak. This declaration of policy which will be found elsewhere in this issue, recognized the necessity for such development of wiring methods and materials as is necessary to provide the greatest use of electric service, and yet be consistent with public safety and convenience. At the same time, this policy was definitely opposed to the introduction of any materials or methods which did not of themselves provide for inspection and competent installation.

The final paper at the opening session, entitled "The Buyer and the Seller," was an impassioned plea by Wm. McGuineas, president of the Chicago Electrical Contractors Association, for fair play.

"Electric Range Merchandising and Wiring" was the subject of the report at the merchandising session on Monday afternoon, by F. T. Langford of Minneapolis. This somewhat lengthy report covered both the merchandising of ranges by dealers, and the merchandising of range wiring. It was based upon a questionnaire survey of the opinions of contractors and others in the United States and Canada. The conclusions of this survey, which will be found further along in this issue, are based upon the successful operation in many cities of coordinated work by the contractors, dealers and utilities.

Louis Kalischer, Brooklyn, N. Y., presented a paper on "Merchandising and Time Payments," which was an explanation of a plan of operation in New York City, whereby dealers who are members of the Electric Association and qualify, are able to participate in an industry merchandising and time payment program.

The subject which created the largest amount of attention and debate, was the proposed new constitution and by-laws. The Executive Committee and a sub-committee had been at work on the new constitution for nearly a year. The convention, however, objected to it on the grounds that it placed too much power in the hands of the Executive Committee, and made it unnecessarily difficult for members to vote for independent candidates. There was also an objection to the restrictions on candidates for offices. It was voted to refer the proposed constitution and by-laws back to the Executive Committee for further study and later report.

E. N. Peak, chairman of a special committee on Association financing, reported that it did not seem advisable to make any changes in Association financing at this time.

Ralph M. Walker, Atlanta, Ga.,

Busy Chicago Convention Committeemen

Samuel R. Todd (center) as chairman of the entertainment committee received much deserved praise for a good job well done. Mr. Todd is a member of the Electrical Inspection Bureau of Chicago. His able assistants, A. A. Gray (left) vice-chairman of the committee and manager of the Electrical Association of Chicago; and J. Walter Collins, a member of the convention's general executive committee, otherwise secretary of the Electrical Contractors Association of Chicago, were also very much in evidence at all functions.

Retiring Executive Committee

Standing Left to Right: W. W. Ingalls, J. A. Fowler, A. C. Brueckmann, R. R. Reid, Lloyd Flatland, J. H. Schumacher, F. T. Langford, R. J. Nickles, H. B. Frazer; *Seated:* A. J. Hixon, W. W. Clark, G. M. Sanborn, *Vice-president* Earl N. Peak, *President* L. E. Mayer, D. B. Clayton, Louis Kalischer, W. J. Squire.

UMI

Ladies at Play

Our N.E.C.A. ladies were comfortably seated at their bridge tea party in the South Club of the Hotel LaSalle during the Tuesday afternoon sessions. A good time was reported by all.

used the theme of his paper, "Proper Differentials Between the Contractors and Consumers" as the basis for a suggested plan of Association regional set-up and program. He told of the manner in which Georgia is now being organized, and how by spreading to adjoining states it will be possible to secure a recognition on the part of the manufacturer of the principle that the ultimate user is a consumer, regardless of size. This principle takes with it a recognition of the contractor with a differential over the consumer. At the conclusion of Mr. Walker's remarks, the Executive Committee was instructed to draw up a plan with a regional set-up.

J. A. Smith, public relations committee, International Association of Electrical Inspectors, Eastern Division, spoke on "Safeguarding Electric Service Within the Home," wherein he told of the work of the inspectors in public education through advertising and other forms of publicity. There was also exhibited a display board which is being loaned by the I.A.E.I. to different communities for the purpose of educating the public in home electrical safety.

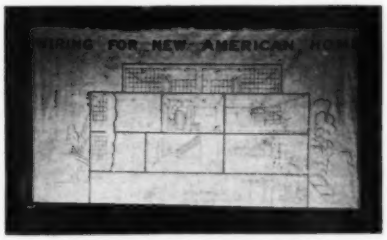
D. W. Tracy, international president, International Brotherhood of Electrical Workers, in his paper entitled "The Future of Our Industry," left the thought that organized labor believes that the maximum progress can be made through cooperative programs between well-organized groups of employers and employees.

The motor specialists had an extended session under the chairmanship of J. R. Stolzenbach, Baltimore, Md., who was elected to succeed himself for another term. The greatest interest in this session centered in the motor discount situation. The members were critical of the manufacturers' present discount schedule which did not permit a motor specialist any profit on certain orders, and greatly reduced profits on others. The effect of these new policies of the motor manufacturers on the dealers' pocketbook, was shown in a paper prepared by F. O. Sievers of San Francisco, and delivered by Lloyd Flatland. A new schedule of discounts such as was reported in the August issue of ELECTRICAL CONTRACTING, was suggested by H. B. Frazer of Philadelphia.

Former Governor A. O. Eberhart of Minnesota, represented the Federal Housing Administration, speaking on the National Housing Act as "A Stimulant to Business."

Arthur L. Abbott, Uniform Legislation Department of NEMA, spoke on "State Electrical Legislation," in which he outlined the growing interest in state legislation and the manner in which NEMA is trying to be helpful through a proposed state licensing act, details of which will be found elsewhere in this issue.

Some rather straight-from-the-shoulder suggestions were made by Emery Stanford Hall, president, Chicago Chapter, A.I.A., and officially representing the president of the American Institute of Architects.



Staging a Wiring Presentation

If the building industry is to come back there must be washed out, in Mr. Hall's opinion, all influences which make free and fair competition impossible. Some of the things which are to be given consideration in this connection will be found elsewhere in an abstract of Mr. Hall's paper.

A number of very interesting lighting developments, some of which were spectacular, were shown by J. L. McCoy, commercial engineering department, Westinghouse Lamp Company, Bloomfield, N. J., in the course of his paper entitled "New Light Sources and Their Application." Most of these applications have not yet reached the market commercially, but are indicative of

1. A. Lincoln Bush, *Belmont Elec. Co., Inc. New York, N. Y.*
2. A. L. Swanson, *Swanson-Nunn Elec. Co., Evansville, Ill.*
3. J. H. Schumacher, *Winnipeg, Man., Canada, Schumacher-Mackenzie, Ltd.*
4. E. (Eddie) Delany, *Home Elec. Shop, Galveston, Tex.*
5. John Kuhlemeyer, *Maywood, Ill.*
6. R. C. Bigby, *Bigby Elec. Co., Inc., Tampa, Fla.*

UMI

the trend of future lighting toward the use of different kinds of gases as illuminants.

"The Story of Safecote Electrical Conductors" was told by A. Penn Denton, field engineer, Safecote Rubber Wiring Manufacturers. Several samples of wire were passed out, showing the effects of different tests. With the paper there was also distributed a copy of the industry performance specifications for Safecote electrical conductors.

E. A. Brand, chairman of the Joint Industry Committee for preparation of Manual of Wiring Design, told how the adequate wiring standards had been developed, and the necessity therefor, closing with some suggestions as to how the new manual can be used when made available next spring.

An interesting presentation was made by Homer G. Knoederer, engineer, construction materials, General Electric Company, Bridgeport, Conn., illustrating graphically the methods of wiring in the "New American Home." The engineering principles on which these methods are based, were fully presented in the July issue of ELECTRICAL CONTRACTING. A cross section scale drawing of a typical residence was painted upon a 15-ft. by 30-ft. canvas drop, and provided with high intensity backstage silhouette lighting. A complete schematic wiring system, from service wires through the distribution centers and feeders to the various outlets was superimposed upon this drop, but left temporarily covered with strips of adhesive tape. These strips of tape were removed by an attendant as the discussion progressed to each part of the wiring system, revealing a luminous red band or wiring outline when the complete installation had been described.

The final address was made by Victor H. Tousley, secretary, I.A.E.I. and also secretary, Electrical Committee, N.F.P.A., who outlined several of the more important changes in the 1935 National Electrical Code.

The entertainment committee provided an unusually fine entertainment by celebrities at the annual banquet, Tuesday night, at which time President Mayer presented General Manager and Mrs. Davis with a silver service as a token of appreciation for the untiring efforts and wholehearted cooperation received during the sixteen years that Mr. Davis has been connected with the National Association.

The ladies who attended the convention were entertained at a style show on Monday, a luncheon on Tuesday, and cards on Wednesday.

Samuel R. Todd of the Chicago Inspection Bureau was chairman of the Committee, and A. A. Gray, manager, Electric Association, was vice-chairman. The women's entertainment committee was headed by Mrs. Della Delaney of the Chicago Electrical Contractors Association, with Miss Hazel Keller Brown of the Electric Association as vice-chairman. John H. Gilchrist, vice-president, Commonwealth Edison, was honorary chairman of the general executive committee, of which Wm. McGuineas, president, United Electrical Construction Company, was chairman, and C. K. Cregier, chief electrical inspector, Department of Gas and Electricity, was vice-chairman. Kenneth Curtis, president, Curtis Lighting, Inc., was chairman of the finance committee.

Farewell Until the Next Convention

Earl N. Peak, the new president, and general manager Laurence W. Davis at the adjournment of the Wednesday afternoon session pledged themselves to an administration of continued teamwork. "The show must go on."

Leaders in Codes and Regulations

Four interested personages whose work is closely related to N.E.C.A. welfare, were snapped between sessions. C. W. Gustafson, (left), chief engineer, Mutual Fire Prevention Bureau of Chicago, well-known authority on explosion-proof wiring, recently elected president of the Western Section, I. A. E. I.; Arthur L. Abbott, an honorary member of N.E.C.A. and a member of the N.E.M.A. uniform legislation department; J. A. Smith, Brooklyn, N. Y., representing the Public Relations Committee, I. A. E. I., Eastern Section; and Victor H. Tousley, secretary of both I. A. E. I., and the Electrical Committee, N. F. P. A.

7. G. G. Burkholder, *Burkholder Elec. Co., Kansas City, Mo.*
8. H. W. Donaldson, *McArthur Elec. Co., Chicago, Ill.*
9. George Bixby, *Prokosch Elec. Co., Santa Fe, N. M.*
10. Edgar Rice, *Elec. Const. & Supply Co., Alton, Ill.*
11. J. S. Copeland, *J. S. Copeland Elec. Co., Inc., Houston, Tex.*
12. M. E. Hart, *Hart Enterprise Elecl. Co., Inc., New Orleans, La.*

UMI

Code Regulation of Industry Necessary*

by President L. E. Mayer

SIX years have passed since I was installed as the president of the National Electrical Contractors Association and during this period we have passed through many changes in business methods.

At the time of my election in Swampscott in 1929, we were in the midst of a very active building program, but since that time the building industry requirements have been very greatly limited. And now while it is predicted that we are just about to return to a more aggressive program, we still find the architects and engineers have not the building demand that would lead us to believe that "prosperity is just around the corner." Nevertheless our conditions are much improved over the last two years.

We are hopeful that the public will soon require a greater volume of building activity and we believe the first that will show the results of any active program will be residential building. Hotels and office buildings will be the last to be considered.

When the Congress passed the National Industrial Recovery Act, we were prepared as a National Association to step in and take the responsibility for writing and administering a code of fair competition.

Our industry was one of the first to accept responsibility for such regulation in the construction field and we feel that we can say with a great deal of pride that the Electrical Contractors' Code was one of the best written pieces of business regulation that has ever been developed within the building industry and also the best administered.

It is very unfortunate that we could not continue to enjoy some of the privileges outlined in the administration of the Code. While it was not a perfect document it did tend to correct some of the worst evils of our industry.

L. E. Mayer,
Retiring president N.E.C.A.

The filing of bids and the publication of the same to the contractors who were bidding on a project was very valuable to the industry and had much to do with the correction of bidding practices between the buyer and the seller.

Whether we will ever again enjoy the privileges that were outlined in this administrative regulation is of course a speculation; but I believe that it will be necessary to regulate industry along the lines of fair competitive laws in order to correct some of the unfortunate conditions in business today.

Competition is very important if it is fair competition. Competition is very serious if it is unfair competition.

It may be considered by some that the rule of the survival of the fittest is the proper program for contractors to follow, and the contractors who can afford to stand the continued program of price cutting and price discrimination in order to survive and have the others pass out is one that must be followed; but I believe such a practice is not economically sound, fundamentally reasonable, or American in its policy. Hence, the necessity of trade practice regulations.

Membership enrollment in our National Association has given your president considerable concern during the past few years. We have seen the increase and decrease of our membership many times in that short period of time.

It is quite conceivable how this may occur because we are dealing with a National Association that does not sell its services on the basis of the dollar value, but is one of those intangible relations with industry that we cannot deal with without a national organization.

Our National Association is a necessity. It has the important function of contacting with other organizations that are national on problems that cannot be solved locally.

We have many conditions to correct if we are aggressively to promote the industry from a practical standpoint, and this I am sure can only be done by a national association contacting with other national bodies.

It would seem to me that in order for the National Association to expand its membership, each one of our members should feel that he is responsible for the increasing of our numerical strength. If he would accept this responsibility in the spirit which is required to accomplish the best results, I am sure we could double if not treble our membership within a very short time.

**Abstract of address before National Electrical Contractors Association, Thirty-third Annual Convention, September 23-25, 1935, Chicago.*

UMI

Voluntary Agreements*

by W. W. Ingalls
Chairman of Special Committee

AT a meeting of the Executive Committee of N.E.C.A. held here in Chicago in July, only a few weeks after the Supreme Court's decision declaring the N.I.R.A. unconstitutional, it was recognized that sufficient time had not elapsed since the abolition of mandatory codes to intelligently offer a plan of procedure for voluntary codes. A special committee was appointed to make a study of voluntary code plans and their legal and practical operation within our industry.

This special committee asked leading electrical contractors in the principal cities throughout the country the following three questions:

1. *"Have you a voluntary agreement in your locality?"*
2. *"Do you believe a voluntary agreement would be successful in your locality?"*
3. *"What suggestions would you make as to voluntary agreements?"*

Replies were received from 69 per cent of the men to whom the letters were sent, showing the very great interest in the subject by our industry. Of these replies, 82 per cent stated that no voluntary agreements had been undertaken in those localities, and that without some greater powers of enforcement than existed under the N.R.A. Code, any voluntary code would, in their opinions, be unsuccessful and unworkable; 18 per cent stated that voluntary agreements have been drawn up for their localities, and have been or are soon to be put into operation, but in no case has such an agreement been in operation long enough to gain adequate experience in their opinion.

The answers received from the 82 per cent who felt that strictly voluntary codes would be unsuccessful and unworkable, were almost unanimous in stating that the experience under the N.R.A. code showed that a code is no stronger than the policing power behind it for its enforcement, and that without effective policing and strict impartial enforcement the code shackled those who voluntarily and fairly lived up to it and left their unscrupulous competitors free to undermine and destroy them.

Every answer received by the committee stressed two outstanding conditions that prevail in every section of the country—the rapid sinking of our industry to pre-code practices of destructive competition, and the crying need for industry organization to bring men back to sane business methods and to halt the present demoralization. The situation demands prompt measures.

No FTC Help

There does not appear to be any substantial help to be obtained through the Federal Trade Commission. The N.E.C.A. held a "Trade Practice Conference" under the Federal Trade Commission prior to N.R.A. and after more than a year of negotiations with the Commission obtained a set of Trade Practice Rules for the Electrical Contracting Industry approved by the Federal Trade Commission on Nov. 10, 1931.

As a result, after going through all the procedure of obtaining the Trade Practice Conference rules, we then found ourselves without any tangible background of enforcement other than voluntary act of the industry member to live up to a code of ethics.

We have had this whole question up with the Federal Trade Commission in the past three months, and although they would like to have us go through the formula of another trade practice conference in order to give the semblance of their importance to industry, any effort to pin them down to a promise or even a hope of effective enforcement of rules under their jurisdiction brings out the fact that they are without any enforcing power not already available to any business man for prosecutions against actual infractions of existing laws.

It is obvious that any industry code of fair competition to be effective must have a means of enforcement in co-operation with other interested agencies as well as the electrical contractors themselves. Codes or agreements have been developed in a half a dozen cities in which the co-operation of organized labor as effecting the enforcement of the code upon all members of the industry operating under agreements with organized labor, and upon projects upon which organized labor must be employed, holds promise of making such agreements workable and enforcible.

Such agreements to be effective must go beyond what could be termed strictly voluntary agreements and must embrace all members of the industry employing organized labor. This does not mean that such agreements could not be properly designated as voluntary since the determination of policy of employment by an employer and the character of work upon which he proposes to compete is entirely a matter of his own choice. The acceptance of the agreements for industry self-regulation, however, must be just as much a part of union agreements between the employer and the union as the working rules of the union agreement itself.

No Collusion

It is of utmost importance however, that Codes of Fair Competition in which the co-operation of labor is invited to bring about their enforcement shall be entirely free from any dangers of illegal restraint of competition which could lead to charges of collusion involving both labor and employers.

There should be no restraints against submitting bids in which there is included the prime cost of labor and material plus an overhead charge commensurate with the size of the operation plus a profit, and provisions for determining fair competition should not in any sense mean the fixing of the ultimate price of the operation to the buyer.

Your special committee feels that these several codes in which both organized labor and employers are co-operating to correct the intolerable conditions of unfair competition existing today may point the way towards a workable solution of the problem of industry self-regulation but that none of these agreements have yet had sufficient actual experience to prove their workability. We recommend that the experience from these plans be studied carefully and that as they develop their soundness that they be made the basis for industry self-regulation elsewhere.

*Report submitted to Thirty-Third Annual Convention, N.E.C.A., Chicago, Sept. 23-25.

UMI

Wiring Policy*

By Earl N. Peak
Vice President, N.E.C.A.

THE art of electric wiring has progressed through many stages since the industry was founded more than half a century ago. There are undoubtedly members of the Association at this convention who can remember some of the earlier types of wiring materials which are today out of existence and which perhaps are unknown to many of the younger contractors, such as insulated conduit, brass armored tubing, wooden cleats and rosettes, etc. A healthy industry is always in flux, and it is a danger signal of stagnation when the art of an industry ceases to develop new methods and new materials.

The first efforts of engineers on all new developments are directed to finding the means to get it done; the next step is directed to getting it done better and more efficiently, and the third inevitable step is to get it done at lower cost without loss of efficiency.

Many of the outstanding successful electrical manufacturers of today started as electrical contractors, and their manufacturing businesses have grown out of the knowledge of the electrical installation problems and their inventive genius in designing new and better materials to meet those needs. There is the same opportunity today that has existed in the past for electrical contractors to use inventive genius in designing new wiring materials and methods to meet better, more effectively, or at lower cost the installation problems which are the electrical contractors daily business.

Development in many lines of industry can be left entirely to the natural laws of supply and demand since the products of the industry involve no hazards to life or property. The use of electricity, however, requires definite safeguards against life and fire hazards, and because of this the development of the art of wiring for the use of electricity has necessarily been surrounded with definite laws to safeguard and protect the public. The National Electrical Code, which was the outgrowth of recognition of the need for uniform laws governing electrical installations, was originally drawn in 1897 by a national conference of various insurance, electrical, architectural and allied interests. From that original national conference there was developed the present sectional Electrical Committee of the National Fire Protection Association, which is composed of representatives from twenty-five national organizations of the interests affected by electrical utilization — insurance companies, electrical inspectors, electric utilities, electrical manufacturers, electrical contractors, Government agencies such as the Bureau of Standards, and groups of users of electrical services such as the railways, telephone companies, etc. It is the responsibility of this Electrical Committee of the N. F. P. A. to develop the laws governing wire installations to properly protect the public, and yet to recognize advances in the art itself when new materials which provide for more effective or lower cost installations are approved under proper procedure.

It is not the place of the Electrical Committee to determine the economic justification for a new material if such a material does not involve installation hazards that are against public interest. The economic problems in such new materials and the justification for such new materials can only be determined by the same laws of public acceptance and supply and demand which all other lines of industry must encounter. If a material is safe under the standards established by the Underwriters' Laboratories tests, and is acceptable for use under rules established by the Electrical Committee, such material has every right to seek its place in the competitive struggle for business. If it fills a recognized need it will succeed; if not, it will fail.

Frozen Standards

It is recognized that frequently standards which have a definite place in industry progress, subject to normal revision and development with the progress of the art, have become frozen by their enactment into laws which later may result in preventing the acceptance of newer developments and the enjoyment of the advantages of such developments in communities where statutes have made the old standards static.

Need for changes in the methods and materials for wiring grows out of new applications for the use of electricity or increased demand for the popular use of such applications requiring the bringing of the cost of both the devices and the wiring down to meet the pocketbooks of the average public instead of the limited applications in its early stages. The rapidly increasing use of electric ranges, electric water heaters, and other heating devices, which are passing out of the luxury stage and

*Delivered before Thirty-Third Annual N.E.C.A. Convention, Chicago, Sept. 23-25.

13. W. A. Ritt, *Minneapolis, Minn.*
14. Robt. W. McChesney, *Washington, D. C.*
15. Axel T. Smith, *Sioux City, Iowa.*
16. A. F. Bell, *Youngstown, Ohio.*
17. Louis Freed, *New York City.*
18. W. G. Hoffman, *Knoxville, Tenn.*

UMI

entering the field of the average householder, have brought out such new developments seeking to lower installation costs.

It has been charged by some interests in the past that electrical contractors have resisted efforts to lower the cost of wiring. Electrical contractors are not actuated by any desire to retard the development of wiring to its lowest possible economic cost consistent with safety. They have recognized the danger of too precipitate action in acceptance of experimental materials or methods and have consistently urged that proper safeguards be set up and trial periods established under adequate supervision before radical departures from standards based upon long experience be permitted.

Electrical contractors also realize that the most dangerous hazards in electrical wiring, the greatest public menaces, lie in installations made by incompetent persons without supervision or inspection. A wiring material which would be perfectly safe when installed by a competent electrical contractor, becomes a potential life and fire hazard in the hands of the amateur household handyman beyond the reach of any supervision. Electrical contractors are not favorable to the development of forms of wiring materials which tend to encourage unauthorized installations by such incompetent and unsupervised amateur wiremen and not through competent electrical contractors.

The National Electrical Contractors Association recognizes the importance of as rapid development of the art of wiring as possible for the lowering of costs to bring electrical service within the range of all classes of users, consistent with safety and public interest. To that end the Executive Committee of the National Association has drafted the following resolution and submits it today for your consideration and ratification as the policy of the N.E.C.A.:

The National Electrical Contractors Association declares its policy to be the extension of electrical service to the greatest number of users and to this end the Association believes that every effort should be made to reduce the cost of electrical installations through developments in wiring methods and installation practices consistent with the safety and convenience of the public which must be safeguarded at all times.

Range Merchandising and Wiring*

by F. T. Langford
Minneapolis, Minnesota

INASMUCH as utilities and manufacturers are decreasing their rates and manufacturing costs, making it possible to merchandise ranges, it would seem only fair that we in the electrical contracting industry should bend every effort to bring the cost of range wiring down to a point where it likewise can be economically sold. We must realize that in most instances our sales expense on wiring jobs is negligible in comparison with range merchandising, for the reason that in most cases the wiring jobs are sold to and paid for by the utility company, thereby eliminating sales costs and certainly credit losses. I do not mean that we should decrease wiring costs at the expense of the safety factor, but by various other methods that we may have at our command.

Spread of Work

Apparently there is some dissension between the contractors and the utility companies as to how this work should be spread, and in some instances the electrical contractor without compensation insurance or without any other responsibility brings all possible pressure to bear on the utility company to give him this type of work, going so far as to get his local alderman, county commissioner, etc., to intercede in his behalf. It seems strange to me that contractors will use such tactics on the utility company. Such contractors do not contribute to any movement that will foster this type of business, but will immediately claim recognition when such movements are fostered by others.

This report is based upon answers to a questionnaire to contractors and others. These answers indicate that there is no definite standard for range wiring, and neither is there a definite price. The price varies from a low of $22 to a high of $75, with an average of $39.28. There is a large variation in the selling price of range wiring to utilities in cities served by the same utility company, even though a few miles away and under apparently similar conditions.

Of course, by the same token it is interesting to note the great variation in the selling price of electrical energy under similar conditions. Be that as it may, there must be some middle ground as to what would be a fair and equitable price for range installations. Of course there will always be differences due to types of wiring used, types of building, etc., but where all things are equal we should have a similar price, as it must be difficult for a purchasing agent to o.k. a bill for one sum of money in one locality, while a pur-

*Abstract of report presented at Thirty-Third Annual Convention, N.E.C.A., Chicago, September 23-25.

19. W. N. Curtis, Mgr., *Chicago, Ill.*
20. Fred E. Geiss, *Kansas City, Mo.*
21. Geo. W. Patterson, *Toronto, Ontario, Can.*
22. W. L. (Weaver) Fowler, *Fowler Elec. Co., Cedar Rapids, Iowa*
23. H. P. (Herb) Wilson, *Rock Island, Ill.*
24. W. E. (Bill) Evitts, *Davenport, Iowa*

UMI

chasing agent in another locality a few miles away o.k.'s a bill for another sum of money.

From the best information that I have, it would seem that No. 8 wire would suffice for range wiring. I do not mean by that that No. 8 should be the size of service, nor No. 6, as generally speaking No. 6 is sufficient to meet the present needs only, and for an adequate service nothing less than No. 4 should be used.

An analysis of the questionnaire would indicate there is a definite field for range merchandising and wiring, but in order to be successful the electrical contractor dealer should follow at least a few simple rules such as:

(a) If interested in range merchandising should install suitable display rooms with suitable merchandise for the community to be served.

(b) Make the necessary arrangements for the handling of time payments.

(c) Use the various mediums of advertising, such as newspapers, radio, telephone, cooking schools, luncheon clubs, equip your trucks and automobiles with proper signs, and either employ salesmen who are thoroughly trained in this type of merchandising, or, when selling yourself, become thoroughly familiar with the subject.

(d) Begin by installing electrical ranges in your own home, then talk to your employees, to every salesman that calls on you, and especially those in any branch of the electrical industry, and when this group is sold, you will find that selling the general public will not be so hard.

(e) Become familiar with your rates, so that you can talk intelligently when this subject is brought up.

(f) Join your local and your national association. Neither successful merchandising nor contracting can be carried on unless we are united. The utility company must have some group or groups to talk to when they are developing their load-building programs, and unless we are organized this cannot be accomplished. It is significant to note that the greatest success in this type of merchandising has been where there is a local association tied in with the national.

(g) Analyze and become familiar with your cost of doing business. The questionnaire indicates a wide range of costs.

(h) As in range merchandising, analyze your overhead in range wiring. It is indicated that the average overhead on this is 21 per cent. Therefore the net profit at the present price of range wiring installations is very limited, if any.

25. R. (Bob) Honegger, *Des Moines, Iowa.*
26. Charles M. Beltzhoover, *Cincinnati, Ohio.*
27. W. J. Squire, *Kansas City, Mo.*
28. Leo. J. Witt, *Youngstown, Ohio*
29. Wm. C. Krauth, *Louisville, Ky.*
30. R. R. Reid, *Salt Lake City, Utah.*

The Future of Our Industry*

by D. W. Tracy

International President I.B.E.W.

REPEATED reference to enforcement may grate harshly upon your ear-drums, but I assure you this is not by design. Through group action we express the hope that minimizing personal desire for advantage over our fellows will be a result. Therefore, if we are sincere in group action we obligate ourselves to the acceptance of group determination.

So long as we are humans of and from humans, just so long will we be the victims of the heritage and environment of humans when acting on our own initiative. All this is true of the employer and employee alike in our industry. Our agreements with employers constitute regulation charters which permit effective enforcement of the codes subscribed to by our members.

Our brotherhood being a highly cooperative institution, is quite capable of being reciprocal in its relations with the employer. Of course, if the employer does not desire reciprocal enforcement, then the effectiveness of our organization is limited to the action of our group.

Through years of experience our brotherhood has acquired the opinion that non-union employees within the industry are purely opportunists who seek to profit by the sacrifices made by union members in the interest of progress. Naturally, our opinions concerning employers who do not promote organization and abide by the regulations adopted by organizations of employers, are quite similar to those we hold regarding employees.

The electrical contractors and the employees constitute natural allies within the industry. Through sensible acceptance of this fact and through a practical observation of this natural relationship, progress for the electrical contracting industry can be successfully insisted upon. The employer and the employee can each effectively aid the other in developing strength.

Through complete cooperation of thoroughly organized employers and thoroughly organized employees, the

*Abstract of paper presented at Thirty-Third Annual Convention, N.E.C.A., Chicago, September 23-25.

UMI

mistakes of the past can be corrected in the future. Sales can be promoted, maintenance work can be recaptured, house wiring and other fields can be scientifically and successfully cultivated, and the electrical contracting industry can be given new birth.

The answer to what will the future of our industry be rests with you and with labor. Each can aid the other in developing organization. The stronger each is organized the more the other can be aided in promoting progress. Labor alone cannot promote all the advantages common to the industry as a whole. Neither can the contracting fraternity. However, through joint cooperation the advantages to each respective group can be more effectively promoted through the joint cooperation of both parties. But cooperation of necessity must be a voluntary procedure. After the agreement to cooperate is reached, then through that voluntary cooperation proper influences can be exerted to compel the adherence to proper practices.

Labor is ready—labor is willing—labor is anxious to do its part in the making of the future for the electrical contracting industry. I conclude by asking the question: Are the contractors as represented by your organization as ready, as willing, as anxious to do its part? If they are, the future can be made bright.

Plan to Rebuild N.E.C.A.*

By Ralph M. Walker

Atlanta, Georgia

THE overlapping of function of the various branches of the industry which distribute materials has become so acute that the electrical contractors are now facing the problem of either being limited to the furnishing of labor to do isolated and complicated jobs, or being eliminated entirely. The chain stores are selling more materials for small work than the jobbers. No electrical contractor is catering to small work who has not felt this competition. The small work is being done more by amateurs than by contractors. Large work, except in metropolitan areas having an agreement with labor or with other control, is in much the same situation.

We find the jobbers as well as the manufacturers' agents and salesmen are our worst competitors. It is becoming almost impossible to compete with the jobber's salesman, who, while he has no training in laying out jobs, is attempting to furnish that service for industrials and is encouraging industrials to do their own electrical work, in most instances hiring away men from the electrical contractor.

Not all the blame, however, is to be placed upon the manufacturers and jobbers. The situation has been largely brought about by electrical contractors failing to grasp their own opportunities, fighting each other, and not having the backing of a strong national association that a business such as ours should have. We should have a strong association with a definite plan to keep us in the industry, and to oppose those who are responsible for our problems.

To meet this the N.E.C.A. appointed a committee to meet with the manufacturers and jobbers and a number of meetings were held. The larger joint committee was reduced to six, which worked out a plan that expounded the recognition of the idea that the ultimate user is a consumer, regardless of size or purchasing power. The main joint committee recognized that principle, and also the principle that the most economic path for the distribution of construction materials is from the manufacturer to the jobber to the contractor to the consumer.

Then, if that is so, there should be some recognition of these principles in the price schedule. The manufacturers should have a schedule of prices to the consumer, and should be able to control prices on their own materials all the way to the consumer. All schedules should be based on quantity of purchase. If this is right, there should also be a schedule of prices for the contractor which should show a differential on each quantity step. The same principle of providing a discount over the contractor on each quantity step should hold for the jobber. The idea was conceded by both manufacturers and jobbers to be sound. Legal difficulties arose however.

Here is the situation we now face: Our biggest competitor is the fellow from whom we buy. He cannot be blamed because there is no organized resistance. We cannot impress the jobber and manufacturer with our sincerity of purpose until we act as a body.

Our Southeastern Industrial Chapter, with members in six states, has given considerable time and thought to this subject, trying to find some way to make it effective. At a recent meeting, members of that chapter agreed to take leadership in their several states to organize local and state groups having a firm purpose. If the plan is effective, all must be national members.

*Presented at Thirty-Third Annual Convention N.E.C.A., September, 1935.

31. *(Left to Right)*
C. E. Terrell, *Chattanooga, Tenn.*
W. G. Hoffman, *Knoxville, Tenn.*
R. C. Bigby, *Tampa, Fla.*
R. M. Walker, *Atlanta, Ga.*
R. H. Bouligny, *Charlotte, N. C.*
W. W. Ingalls, *Miami, Fla.*
D. B. Clayton, *Birmingham, Ala.*

32. *(Left to Right)*
John E. Launder, G. G. Burkholder, G. V. Dameron, Fred E. Geiss, Harry C. Evans, all of *Kansas City, Mo.*

33. *(Left to Right)*
P. M. Geary, *Youngstown, Ohio*
Leo. J. Witt, *Youngstown, Ohio*
Bill Hazel, *Cleveland, Ohio.*
E. C. Carlson, *Youngstown, Ohio.*

34. *(Left to Right)*
R. J. Nickles, *Madison Wis.* and H. H. Tholen, George Andrae, E. H. Herzberg, of *Milwaukee, Wis.*

UMI

In line with this idea the Georgia State Association has been rejuvenated, and a committee appointed to meet with manufacturers and jobbers. At this meeting the jobbers admitted that the cost to sell industrials was more than that to sell the contractors; that they would be better off if the contractors sold to the industrials. The Georgia association is not asking the manufacturer or jobber to give up anything, but is merely asking that the contractor be permitted to make a profit on the same volume of sale.

In Georgia we have pledged, if the plan goes through, all members not only to maintain prices in selling, but also to observe them in buying. We have pledged that when the plan goes through no man will accept a price lower than a manufacturer's price. If we are going to get anywhere, we must play ball. The trouble is this: Other states are not organized. Jobbers from neighboring unorganized states will attempt to take advantage of the situation.

Our plan, therefore, is that all states must do the same thing at the same time. We must perfect state and local associations. We hope, for instance, that the southern states will form a region, and that other states will form like regions. Then we must have national organization if the plan is to become effective. Manufacturers admit that the present scheme of distribution is all wrong. The price differentials are different in different parts of the country. The manufacturers want a uniform price. We must get the electrical contractors' cooperation, and that is our greatest worry. What will the electrical contractor do with his differential if he gets it? This is serious.

The plan we propose is to obtain from the manufacturer and the jobber the recognition (1) that the ultimate user of electrical materials is a consumer regardless of size of purchasing power; (2) that the proper path of distribution is from the manufacturer to the jobber to the contractor to the consumer; (3) that the manufacturer set up a schedule of materials to consumers, with quantity purchase steps, and insist on price maintenance; (4) that a differential be set up for the contractor over the consumer for each step, and likewise for the jobber over the contractor.

35. *(Left to Right)*
Geo. W. Patterson, *Toronto, Ont., Can.*
J. H. Schumacher, *Winnipeg.*

36. *(Left to Right)*
Louis D. Kennedy, *Brooklyn, N. Y.*
Wm. J. Wheeler, *New York City.*

37. *(Left to Right)*
R. J. Nickles, *Great Lakes Dist.*
F. T. Langford, *Minneapolis, Minn.*

38. *(Left to Right)*
A. S. Schulman (left), *Chicago, Ill.*
Jas. O. Kelso, *Chicago, Ill.*

Fundamentals of State Licensing Legislation

THERE have been twenty-eight bills passed in twenty-two states to date for the regulation and licensing of the electrical construction industry, according to Arthur L. Abbott, Uniform Legislation Department of the National Electrical Manufacturers Association. In addressing the N.E.C.A. convention at Chicago on the subject, "State Electrical Legislation," Mr. Abbott pointed to the great amount of interest that is manifested in such legislation all over the country as indicative of continued progress in this direction. As a result of steady research in state and municipal legislation, Mr. Abbott's organization has been able to formulate a comprehensive state electrical law which embodies certain fundamental conclusions. Although it is not intended that a fixed model law would suit the conditions in all states, certain important operating principles are considered common to all such bills.

Chief among these functions is considered that of a state administrative board, with flexible personnel and a paid state director in charge of enforcement.

In the matter of licensing, the state-wide licensing plan is considered more desirable than licensing by cities, because of the burdens imposed upon contractors when frequently called upon to do work in neighboring communities. Moreover, the examination of applicants can also be centralized by a state administrative board under uniform and equitable standards of qualification. With statewide licensing and inspection it was shown how the problem of obtaining observance beyond municipal boundaries is entirely eliminated.

That conflicting rules or standards in adjoining municipalities result in confusion to the industry was offered as another reason for state minimum standards, with a tendency thereby to foster greater uniformity of requirements.

Mr. Abbott presented a draft of NEMA's latest model state electrical law to the convention. This draft covers among other subjects the following important fundamental provisions:

Creating electrical administrative board, and its duties; Qualifications, appointment and duties of the electrical engineer of the board; Installation and materials standards; Adoption of rules and regulations by municipalities and counties; Appointment of municipal, county and deputy state electrical inspector; Authority of electrical engineer and inspectors; Job permits and annual permits; Fees for permits; inspection and certificate; Reinspection; Licenses required and fees; Examinations.

UMI

Rules for the Building Game*

by Emery Stanford Hall

President, Chicago Chapter A.I.A., representing President of American Institute of Architects

AS WIRING contractors, it is perfectly laudable for you to desire to get as much of the wire craft into the building as possible, but you should bear in mind that there is a limit beyond which you should not go. If I am any judge, I suspect that your industry has rather oversold the public in the matter of electrical devices. If a man spends all of his money on electrical equipment, he has nothing left in which to shelter his purchases and make them properly efficient. If he cannot have a house with more than one outlet in a room, he had better have such a house than no house.

I quite agree with you that if he can afford additional accommodations in the way of various electrical devices that he ought to have them. I am merely speaking for sane balance in building.

In the building game, competent, impartial plans and specifications are the rules of the game and the architect is the umpire. Competition-made plans and specifications can never be fair rules of the game.

Cuss the architect all you like, but be sportsman enough not to try to go over his head. He is in the game for the specific purpose of seeing that everybody on the job, owner, contractor, workman, and the public, gets a square deal.

So-called insurance premiums figured into contracts and charged to owners, where such insurance involves no risk, are no different than robbing in the night with a gun. Contractors who are a party to such procedure are either spineless cowards or there is some sort of bargain for coercive assistance in some game that will not stand the measure of fair competition.

Every common workman is entitled to a fair living wage and justice demands that every craftsman be paid a wage above that of a common laborer in proportion to his skill and the time and expense involved in preparation for his craft. In return for wages, those who receive them should deliver proportionately valuable service.

Labor unions have a legitimate field in the protection of their members against exploitation, in guaranteeing proper wages, and in decent working conditions. They have no place meddling with the contractor's or owner's business; neither should they enter into any sort of alliance to collect contractors' bills or to exercise coercive influence over the amount of his fees. In the long run, such practices only redound to the detriment of everybody involved.

*Abstract of address before thirty-third Annual Convention, N.E.C.A., Chicago, September 23-25.

Adequate Wiring Manual

THE new Manual of Wiring Design, covering adequate wiring for residential, industrial and commercial interiors is now being compiled and will be ready next spring. There are four ways, according to E. A. Brand, chairman Joint Industry Committee for Preparation of Manual of Wiring Design in a paper before the N.E.C.A. convention, in which the electrical contractor can use the manual when it is made available, as follows:

a. Work with your electric utility, either as an individual or through your local association, so that every architect, consulting engineer, general contractor, builder, and electrical contractor in the area where you operate is supplied with this book and knows how to use it.

b. It has been said that the contractor, generally speaking, is not sales-minded enough. Naturally he is in a difficult position when he attempts to sell the architect on additional wiring capacity for a building on which he has been asked to bid.

But he can call on the utility to sell the architect or the owner on additional capacity when he receives a set of poor plans or specifications. Your own judgment naturally will determine whether you convince the architect or whether you ask for assistance from the utility or the electrical league.

c. Each of you from time to time receive jobs, possibly on a time and material basis, that involve electrical remodeling or additional work. The principles outlined in the Design Manual should be used in determining the proper wiring layout and the essential capacities.

d. I would like to suggest that those contractors who maintain a sales organization go out and sell rewiring installations. Remember that the Design Manual proves that doubling the capacity does not double the cost. It will indicate that undervoltage results in unsatisfactory operation of lighting and heating equipment — the penalty of small copper. It will show the cost to the owner of copper losses in branch circuits and feeders; that wiring inadequacy frequently results in reduced rentals and in loss of tenants, as proved by actual surveys.

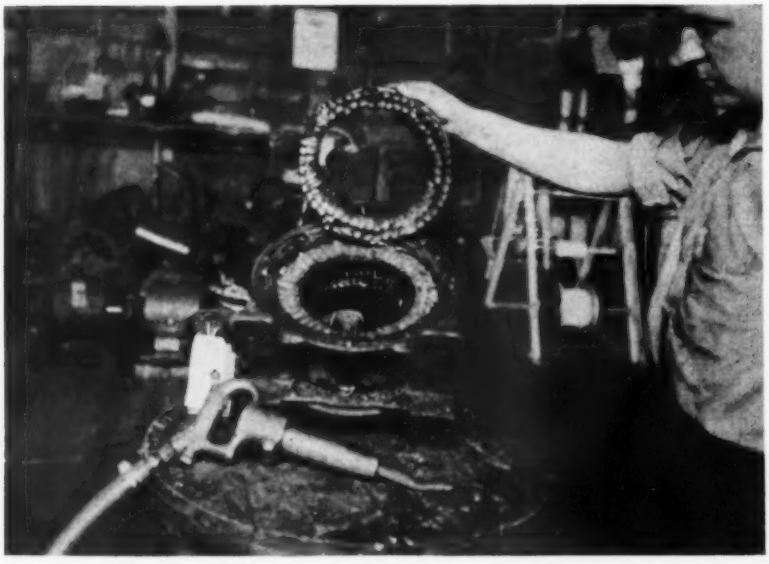
39. John L. Flagg, *New York City*
40. H. B. Frazer, *Philadelphia, Pa.*
41. Wm. L. Marks, *Chicago, Ill.*
42. C. E. Terrell, *Chattanooga, Tenn.*
43. J. R. Stolzenbach, A. C. Brueckmann, and Frank Stark, all of *Baltimore, Md.*

UMI

Mechanical Stator Stripping

Air-gun cutting tools are kept sharp for skilled operators to cut away one coil end in a solid section. No lamination injury occurs because the tool is guided through with safe clearance.

A clean-cut job without cell distortion goes to the burning stand. It is an easy matter then to strip these coils with a small pinch bar.



AIR gun cutting tools play an important part in stripping burnt-out stators for rewinding in the shops of the Electrical Installation Company, Cambridge, Mass. Because careful cutting of the old windings minimizes damages to stator slots, this operation is given important consideration in motor reconditioning work.

Cheap labor, usually unskilled beginners, is frequently employed in some shops to do such work with crude hand tools. Despite a low hourly wage rate, such practice can prove false economy when consideration is given to the total time consumed, possible damages to the stator, the cost of smoothing such battered or distorted laminations, or the possibility of punctured cells in the rewound job because of overlooking sharp projections that have resulted from carelessness in the stripping process.

Under this company's stripping methods, the stator windings are cut with an off-set shank chisel-blade air gun tool. Cutting is done before the insulation is burned off, thus gaining the benefit of compact cells, which results in a minimum amount of flattening-out or distortion of the cut conductors. Because less distortion occurs in cutting, greater ease of winding removal is experienced after the wedges and insulation have been burned away.

When windings come off easily, there is less cleaning and filing of stator slots to be done. This has caused the Electrical Installation Company to use skilled workers for the cutting operation, and to provide tools for them which would reduce their time to a minimum. Sharp tools in the hands of an experienced cutter will always result in a clean-cut removal of the coil ends in one piece. The cutter is guided into the coil ends so as to leave a margin of ⅛-in. or more clearance away from the stator slots. By learning the "feel" of the gun and blade, very little blade dulling occurs. The operator rarely cuts into the steel frame beyond the coil groups.

The average cutting time ranges from ten to fifteen minutes, according to motor size. The complete cutting, burning, stripping and stator cleaning operation runs from one hour for motors of 2 hp. to 7½ hp. From 10 hp. up to 40 hp. the time runs up to three hours. It is the contention of this company that its policy of using skilled labor and modern equipment for this work is thus justified.

UMI

A Large Pari-Mutuel Installation

IT TOOK a 35-man crew five weeks working seven days per week to install the low voltage wiring and equipment at Suffolk Downs. Boston's new horse racing plant was equipped with an automatic totalizing system that would permit the clearance of huge sums of pari-mutuel betting to its calculating department from numerous outlying betting booths located in the huge grand stands, the Jockey Club rooms, and at the paddocks. This required a great network of relay control wires from these outlying points, which were finally terminated at the central control room in orderly fashion.

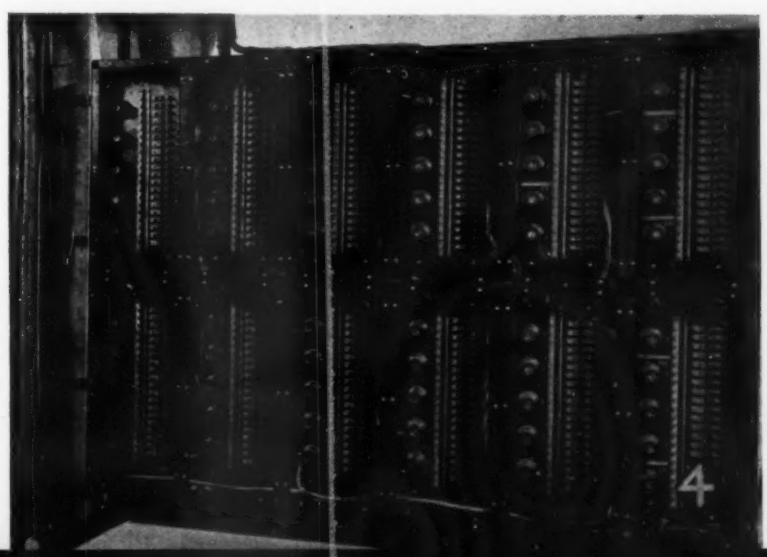
This installation by Quinn Brothers, of South Boston, Mass., was an important part of a $90,000 electrical contract that was all performed in ten weeks. A peak crew of 110 men was required on the job.

1. Totalizer relay racks, the brains of the "Tote" system, where more than 1,000 delicately adjusted relays are housed in three glassed-in cases. Each case is 16 ft. long and contains horizontal racks upon which removable relays are mounted during the racing season. These relays are removed and transported to another plant, therefore special plug-in multiple contacts are arranged in rows. Wiring connections begin at these points and lead outward to the various stations. The 32-volt motor generator switchboard is in the extreme background, while a main control switchboard is at the opposite end of room.

2. The main terminal racks, to which thirty 50-pair braided sheath cables are connected. These cables lead to the relay racks and other special stations, calculating control cabinets, indoor cashier booths and signals. Lead sheathed cables are likewise run underground from this point to outlying stations.

3. An elaborate public address system plays an important part in this plant's operations. The various speaker circuits were run in conduit from the main control panel located in the lofty press gallery. A 32-volt field circuit is used for the loud speakers, thus permitting one conduit being used to enclose all conductors. Some conduits contain two twisted pair voice circuits and the common field circuit, so that six speaker circuits were installed in four ¾-in. conduits.

4. The "Tote" board, which flashes the odds, results, etc., is located in the infield, facing the huge grandstand. Wiring connections for this system were brought underground to the main control room where this terminal rack was provided. Sixty fused circuits and 240 test terminals are connected at this point.



UMI

Construction . . Methods . . . .

One-Piece Hanger for Four Conduits

A compact supporting method which permitted four 1¼-in. conduits to be bolted to a one-piece hanger was recently made up of ½-in. by ¾-in. iron. One end was lagged to the face of a roof timber, while the lower end

was drilled for mounting cast iron one-hole pipe clamps on opposite sides. Four conduits were thus securely hung in a compact assembly. The cross section of this hanger was sufficiently rigid to permit 6-in. offsets being made in it for supporting this conduit away from the adjoining timbers. Ralph S. Walter, electrical contractor of Bethlehem, Pa., employed the above method in wiring an industrial plant.

Out-of-the-Way Capacitor Mounting

A 100 k.v.a. capacitor bank that was recently installed in a Rhode Island textile plant for correcting its power factor, was supported from the ceiling, thus taking up no valuable work space in this crowded plant. This ceiling location also permitted these capacitors being connected to the feeder with a minimum run of conduit. A remote controlled line switch was provided which was also placed next to the ceiling, with merely a small control circuit conduit being run to the control station located on an adjacent column.

The 10 capacitor units were supported by a cradle rack constructed of angle iron main members, and flat iron "X" braces at the ends. Flat iron vertical spacers were also provided. A metal wireway was installed against the ceiling for the

row of units, from which the taps were stubbed down to each set of terminals. This work was installed by the Eastern Electric Engineering Co. of Pawtucket, R. I.

Vertical Racking in Narrow Spaces

Groups of large horizontal feeder conduits must sometimes be suspended below the ceiling in tiers rather than being spread out side by side upon a flat trapeze hanger bar. Such a condition was overcome by the H. P. Foley Company of Baltimore, Md., by making up yoke hangers of ¼-in. by 1-in. flat iron and suspending them from ½-in. hanger rods which threaded into concrete inserts at the ceiling. This method permitted the routing of three 2-in. and one 3-in. conduit behind a vitrified tile wall which was to be built in front of a line of concrete columns. This wall thus needed to clear only the overall diameter of the one 3-in. conduit. A conventional trapeze hanger method would have required greater wall clearance, thus decreasing the useful floor area, or some of the conduits would have extended out into the room, presenting an unsightly ap-

pearance. The tier racking method also eliminated conduit offsets where they were stubbed down to their panelboards.

These yokes were made in two pieces with through-bolts below each conduit. A conduit spacer nipple was used below the 3-in. conduit, while the upper ends were offset to fit against the opposite faces of a hanger rod clevis fitting.

Fixture Supporting Inserts in Stone Walls

The installation of heavy outdoor lighting brackets in the stone walls of a public building at Reading, Pa.,

was simplified by providing ⅜-in. bolt inserts during the construction of the wall. The Keystone Engineering

SO YOU'RE NOT FUSSY ABOUT SWITCH HOOKS?

THAT'S understandable. In all probability the C-H Safety Switch would sell just about as well if lower quality fibre were used in switch hooks, and if the die-cut job on that fibre were less precise. In fact, it is likely that every other detail about these switches might be treated more casually without any great harm.

But C-H is the Control Leader. C-H has only the one manufacturing standard. And so from the mar-proof finish to the clean-cut knockouts, every detail on a C-H Safety Switch reveals care and thought. You may not be fussy about details such as switch hooks—but you are fussy about overall results—and results are the total of details.

Compare C-H Safety Switches with any other, detail for detail, and you will know why Cutler-Hammer's attention to details has earned the acceptance these safety switches receive, and why alert contractors and independent electrical wholesalers everywhere feature them. CUTLER-HAMMER, Inc., *Pioneer Manufacturers of Electric Control Apparatus,* 1306 St. Paul Avenue, Milwaukee, Wis.

● *The C-H line includes all types and sizes of Standard, Weatherproof and Explosion-Proof Safety Switches, and Meter and Range Switches for every locality—all built to the famous C-H Control Leadership Standards.*

CUTLER-HAMMER C-H SAFETY SWITCHES

UMI

THE WIREMOLD ZONE

THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!

NUMBER 11 OF A SERIES ON WIRING OPPORTUNITIES

See how Midget Size Wiremold

Encourages HOME EXTENSION *jobs!*

BUT *does NOT encourage HOME MADE WIRING*

Wiremold makes it easy for the contractor to SELL and PLEASE the home-owner, or the rental agent—

But does NOT make it easy for each prospective customer to make his own electrical installation.

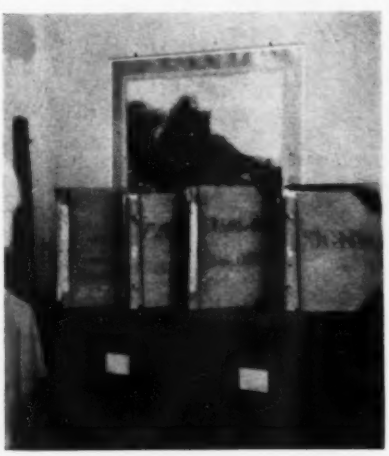
Wiremold helps the contractor!

THE WIREMOLD COMPANY, Hartford, Conn.

Corporation made up a wood template which supported four bolts in the exact bolt-hole spacings of the fixtures that were to be installed. After the outlet box had been set in exact position, this template was bolted to it and left thus secured until after the stone work was finished. Upon the removal of template, the threaded ends of four supporting bolts projected outward about 2 in. This pre-set insert method eliminated drilling holes in solid stone at the time of installing fixtures.

Reference Binder for Small Bulletins

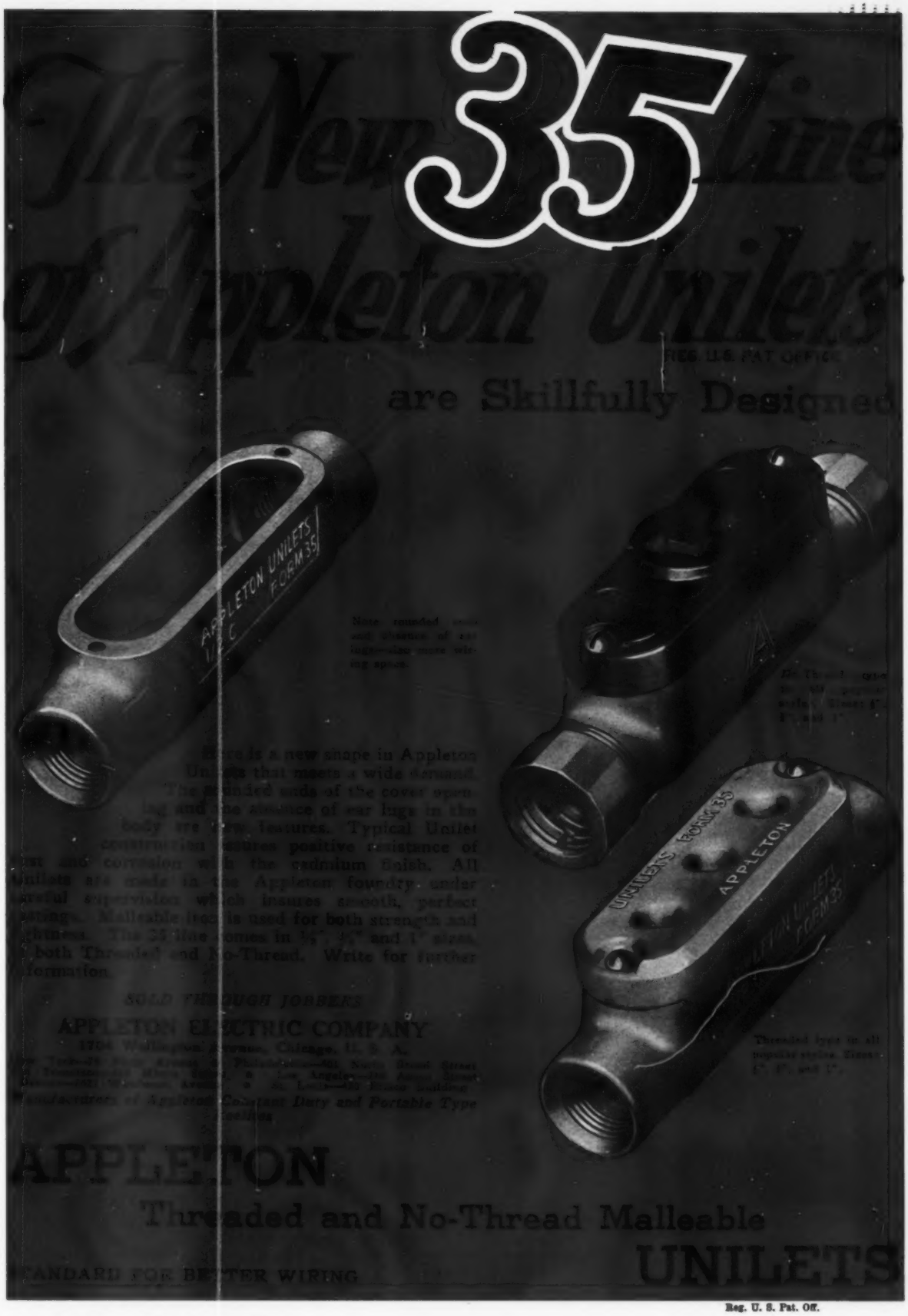
Manufacturers' small bulletins are most needed in the rush of making up estimates, and therefore C. M. Davis and Sons, Harrisburg, Pa., keep such material in handily arranged post binders. This in-



formation is grouped in separate binders, covering two general classes of fixtures, signals, outlet boxes, wiring systems and ducts, emergency lighting equipment, etc. New bulletins are inserted as they are received, in replacement of obsolete data. Because all the data binders are kept down to reasonable size, they are handy to place on the drafting or estimating table for ready reference, and none of the data becomes misplaced under plans or other papers. Larger catalogs are kept on separate data shelves, where they do not become cluttered up with the smaller and separately bound bulletins.

Stock Bin Markers

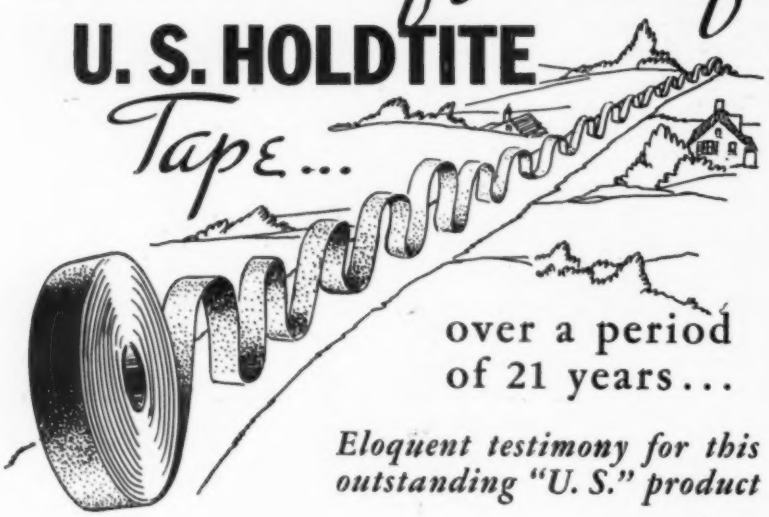
The small items that are stored in stock bin drawers may be identified by pasting an illustration of the item



Reg. U. S. Pat. Off.

Thousands of Miles of

U. S. HOLDTITE Tape...

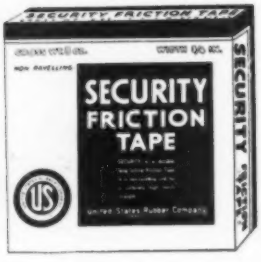


over a period of 21 years...

Eloquent testimony for this outstanding "U. S." product

FOR MORE THAN A SCORE OF YEARS "U.S." TAPE HAS FILLED THE BILL.

No matter what your friction or rubber tape requirements are, you'll always find a "U.S." tape that does the job—quickly, neatly, permanently.



These tapes are tough—have a uniformly high tensile strength—will not ravel—will not dry out. They stick and *stay* stuck. That's why they've won their fine reputation among an ever-growing number of electrical contractors.

Look for the "U.S." trademark the next time you buy tape—you'll be time and money ahead.

UNITED STATES RUBBER PRODUCTS, INC.

1790 BROADWAY, NEW YORK, N. Y.

United States Rubber Company

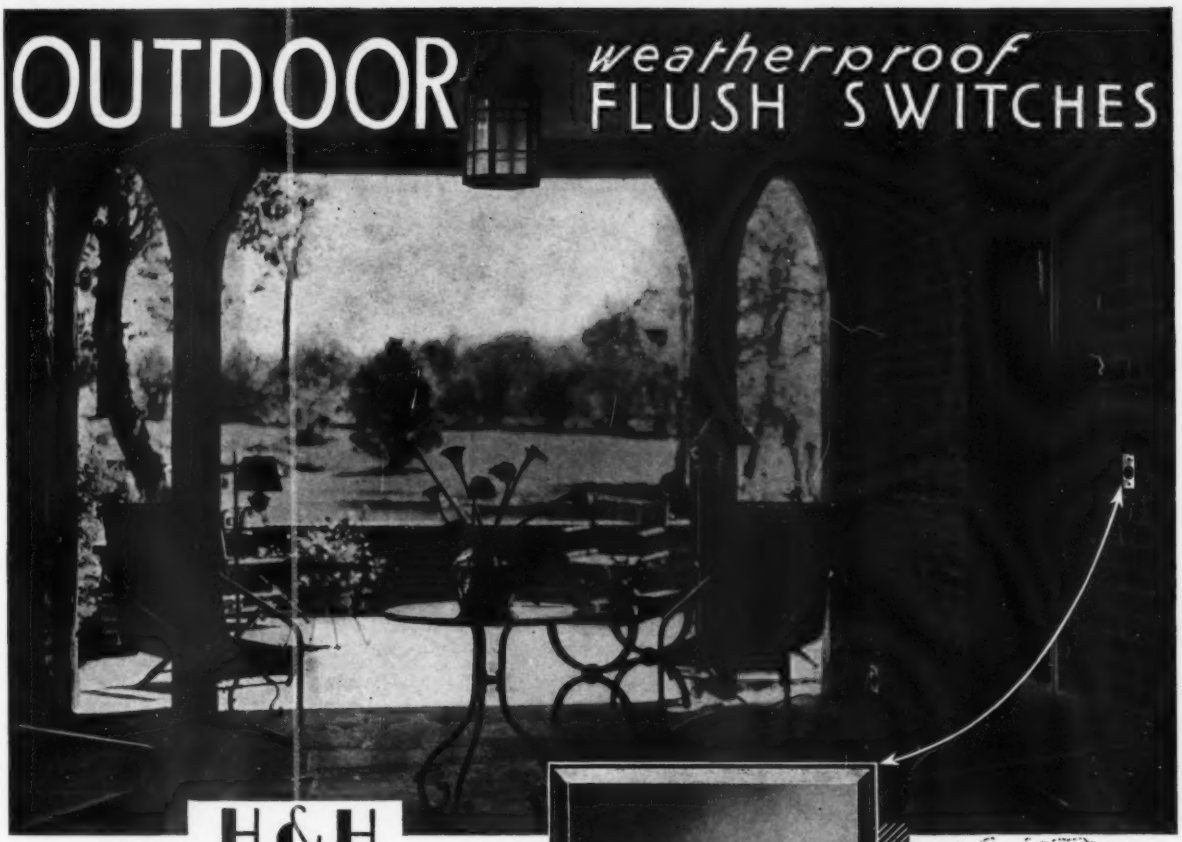
to the end of each drawer. A certain type of socket or other wiring device is thus marked by cutting an advertising illustration of the item from a catalog or trade magazine. This method takes the place of stenciling an abbreviated description upon the end of the drawer, or of fastening a sample item to the outside. When a new type or style device replaces the old stock item, a new cut-out illustration is pasted on over the old one. This method is used by the Nelson-Wood Electric Co., Roslyn, N. Y.

Outlets on Shallow-Furred Brick Walls

The "half-in, half-out" switch or receptacle outlet box which is often encountered on commercial and institutional jobs involves two distinct installation problems. The first is that of getting the conduit into the

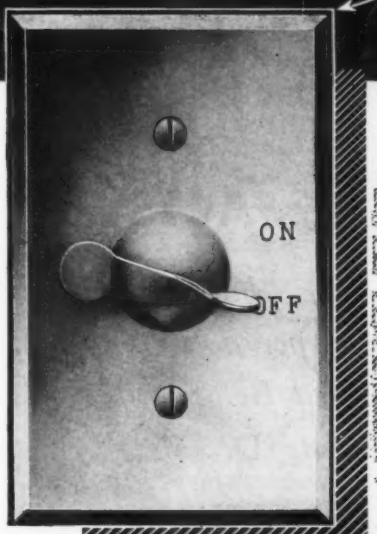
brick-work, and finally the placing and alignment of the outlet box to meet flush with the finished plaster. In wiring a new Long Island high school at Hempstead, N. Y., the Meeker Electric Co., of Williston Park, N. Y., concealed the conduits in the brick wall to within 6 in. of the box. Offsets were then made which would place the outlet box out of the brick a sufficient distance to meet the finish line. This left the box slightly recessed in the wall. Due to variations in furring the use of specially made deep boxes to avoid these conduit off-sets would have been difficult. Likewise the depth of such special boxes would have made wire pulling more cumbersome.

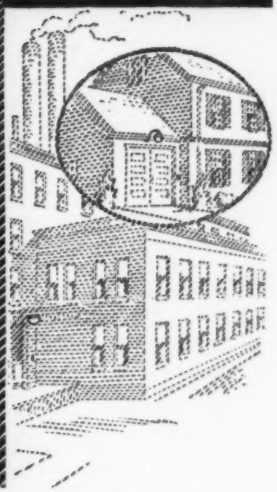
OUTDOOR *weatherproof* FLUSH SWITCHES



H&H

Make OUTDOOR Lighting Control as Convenient as Indoor





ANYWHERE that a Flush Switch must *WEATHER*, this new H & H development brings *convenient* lighting control — as convenient as your conventional *indoor* control. No mechanism is exposed to the elements or to damaging atmospheric conditions. The cadmium-finished brass plate fits over a rubber mat — weather-tight. Operated with a handy lever which points to ON and OFF positions.

The switch fits any standard wall box and is reasonably priced for inclusion in every job. Particularly to be recommended for porch lights; for installation in patios or wherever outside doors should be lighted in house or garage. Comes in single-pole, double-pole, 3-way and 4-way types.

FOR INDUSTRIAL BUILDINGS ALSO: — This weatherproof Flush Switch has current-carrying capacity for industrial-lighting uses as in yards, shipping platforms, entrances or in rooms subject to corroding atmospheric conditions. *Write us* for complete catalog data-sheet.

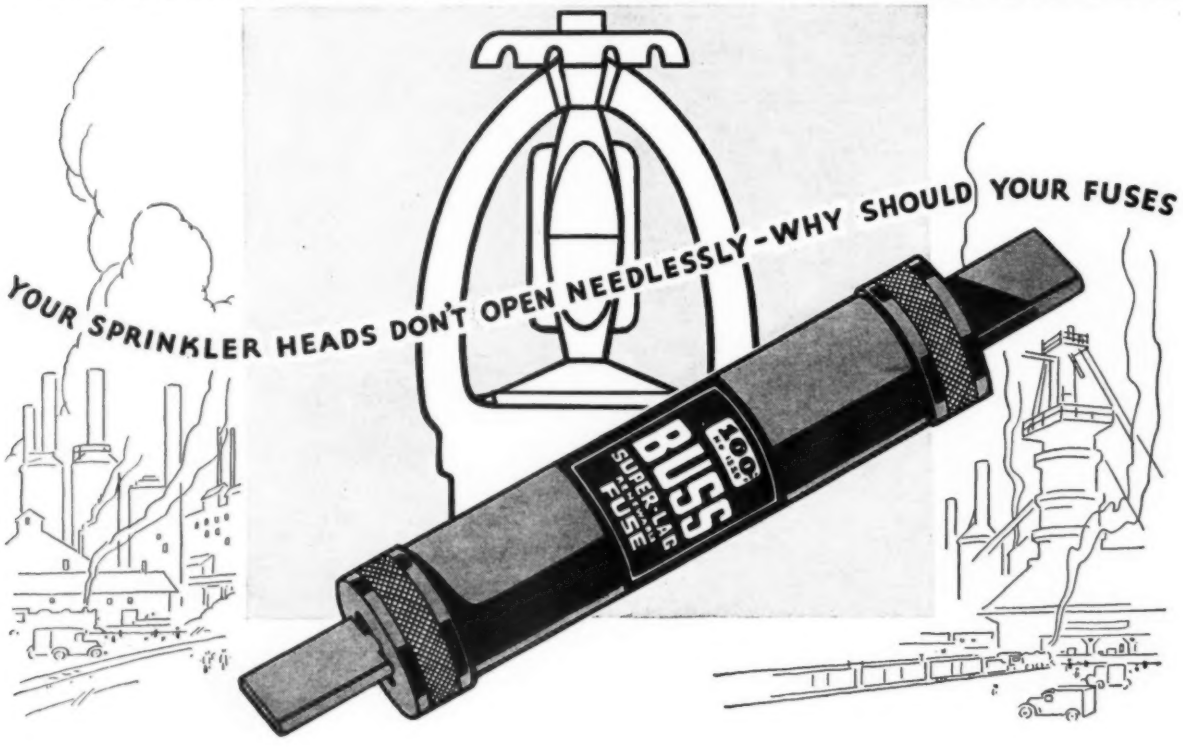
USE THESE NUMBERS WHEN ORDERING:

Catalog Number	Description	Amperes at 125 V.	Amperes at 250 V.	Std. Pkg.	Carton	Pkg. Wgt.
7981	Single Pole	10	5	10	2	7
7982	Double Pole		10	10	2	7
7983	Three-way	10	5	10	2	7
7984	Four-way	5	2	5	2	4

HART & HEGEMAN DIVISION
THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD. CONN.

UMI

FUSES MADE TO PROTECT · NOT TO BLOW



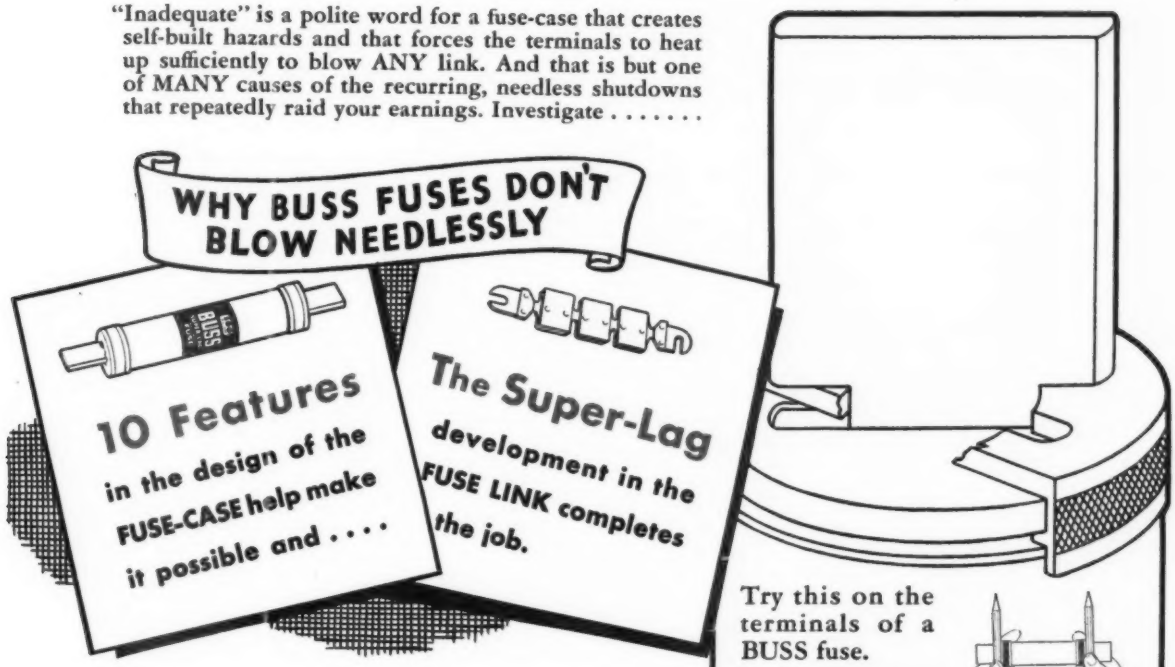
GET THE FACTS—"*We have been having considerable expense blowing an average of one to two 500 ampere fuses per day on the compressor pumps. On Oct. 28th installed BUSS Super-Lag Fuses and have not had a blow to date (Dec. 16th)...We are BUSS boosters from now on.*"

Mr. B. Pomeroy speaking, *Master Mechanic* of the VIERLING STEEL WORKS, Chicago. His present fuses are *Made to Protect* . . . NOT TO BLOW.

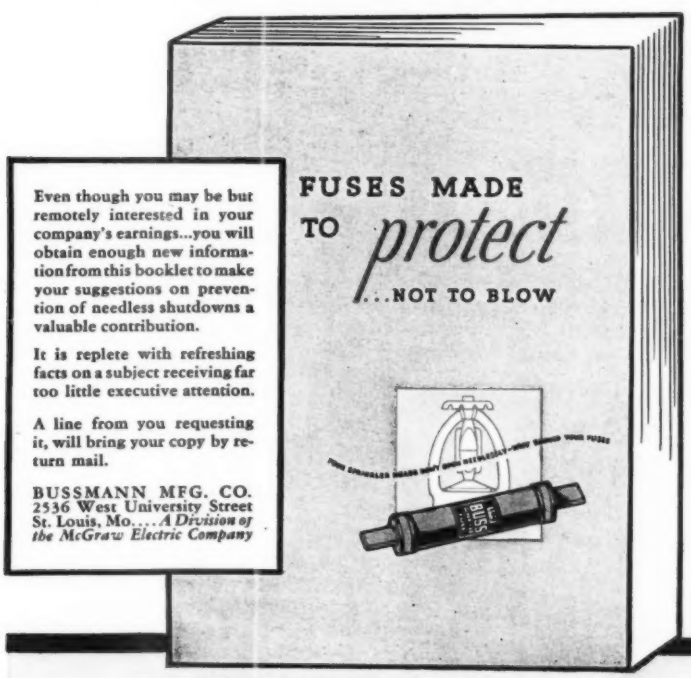
The "considerable expense" referred to was not the comparatively small fuse expense...but that real, considerable and riotously wasteful expense in any factory...which is

. . . the RECURRING SHUTDOWNS *caused by* NEEDLESS BLOWS

"Inadequate" is a polite word for a fuse-case that creates self-built hazards and that forces the terminals to heat up sufficiently to blow ANY link. And that is but one of MANY causes of the recurring, needless shutdowns that repeatedly raid your earnings. Investigate . . . . . .


WHY BUSS FUSES DON'T BLOW NEEDLESSLY
10 Features
in the design of the FUSE-CASE help make it possible and . . . .
The Super-Lag
development in the FUSE LINK completes the job.

GET THE FACTS



Even though you may be but remotely interested in your company's earnings...you will obtain enough new information from this booklet to make your suggestions on prevention of needless shutdowns a valuable contribution.

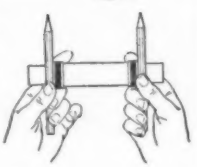
It is replete with refreshing facts on a subject receiving far too little executive attention.

A line from you requesting it, will bring your copy by return mail.

BUSSMANN MFG. CO.
2536 West University Street
St. Louis, Mo. . . . *A Division of the McGraw Electric Company*

Try this on the terminals of a BUSS fuse.

NOTE HOW THEY LINE UP



ALWAYS LIKE THIS

NEVER LIKE THIS

They are locked — you can't twist them out of line.

Now try this test on other fuses.

* * *

Comparisons may be odious — but this one is OBVIOUS.

Isn't it obvious that unless the terminals of your fuse are in perfect alignment you will not get good contact?

Isn't it obvious that where contact is bad heating must occur — and the poor *self-heated* fuse soon thinks it is handling a dangerous overload—and BLOWS — NEEDLESSLY — exacting from you the *surtax* of a shutdown?

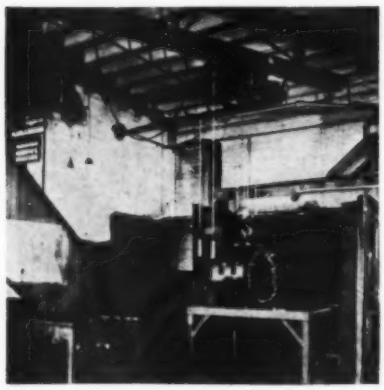
And isn't it obvious that the troubles that blow fuses should originate in circuits, not in fuses?

BUSS super-lag FUSES

Service Shop . . . Practice . . . . . .

One-Man Layout for Dipping and Baking Large Equipment

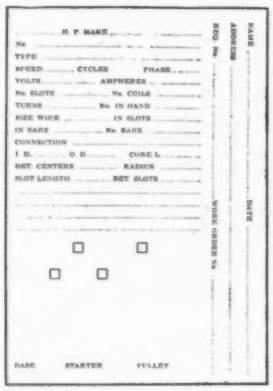
The baking oven and dipping tank layout of the Roland Electrical Company, Baltimore, Md., permits one man to handle large equipment that



is to be dipped and baked. An overhead track which leads from the oven door to the truck type dipping tank space is equipped with a ½-ton movable electric hoist. A double-decked steel frame truck permits two levels of equipment to be racked up for one baking operation.

Initial Transaction Record

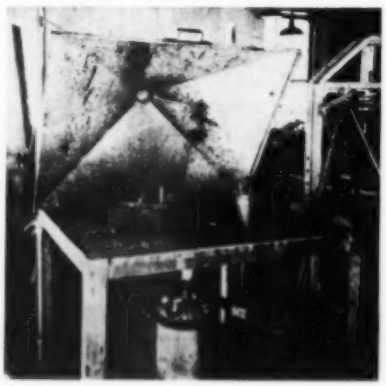
When a repair order is received by the Wolff Electric Works, Portland, Ore., whether by mail or telephone, a special card record is immediately made covering the operations involved. Thus if an inspection and estimate is first required, this card, bearing the customer's name and address, has entered thereon all initial instructions that may ensue prior to starting work. Thus a definite office record is kept available pending an ok. to proceed. When work is commenced this same card goes to the shop, after a number has been assigned to it. It becomes the official shop order from which requisitions and time tickets are made up during the course of repairs. Jobs which come in for immediate procedure likewise are routed into production by this card. During the progress of repairs the



essential description of the equipment and of repairs required are entered upon this card for the permanent office data files. These cards are 6 in. wide and 4 in. high. They are blank on one side, thus providing space for making any notes for which there is not enough blank space on the front.

Cleaning Rack

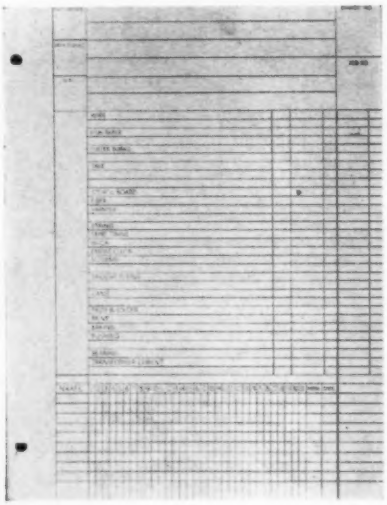
A cleaning rack capable of supporting 1,800 lbs. load was built by the Warren & Bigelow Electric Company, Worcester, Mass., for removing grease and oil from apparatus being repaired. Workmen



can place their equipment upon its heavy mesh platform and apply gasoline with brushes or with air pressure sprays, until the equipment has been suitably cleaned. The residue drains into a safety can below after it is strained through a series of screens to catch all possible sediment. A counter-weighted cover fits over the entire rack when it is not in use. This rack was made 32 in. high, 50 in. wide and 40 in. deep, with four legs made of 3-in. by 3-in. angle irons supporting a 1½-in. angle iron frame. This frame carries a series of screens and an outlet or drain nozzle at the bottom. A heavy steel mesh top rests on a removable section of fire escape grating. Below this grating is a layer of standard window screen, then a finer layer, and last a mesh similar to that used for milk straining. A safety can of 5-gal. capacity is connected by means of a gasketted union to the drain basin nozzle.

Condensed Job Record Form

A ruled form upon which both labor and materials may be entered from shop time cards and material tickets is used as a permanent record sheet by the Wolff Electric Works, Portland, Ore. These forms are



standard 8½-in. by 11-in. letter size, and are punched for placing in post binders in consecutive order, according to shop numbers. There are twenty common types of shop material printed on this form as posting reminders, with eleven blank line spaces for filling in miscellaneous items. The labor section at the bottom of this form provides posting space for nine shop men during an entire month. When a completed repair

Ready-wired molding is cemented to the wall with special AddHere cement. No tacks, nails or screws.

AddHere Pendant "taps" the run near the ceiling with a special fitting, firmly anchored in place.

Seven-foot Pendant, with three-way convenience outlet, is available in attractive colors. White, Ivory, Tan, Gold, Peach, Green.

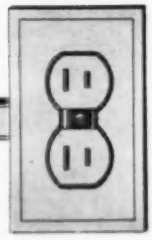
New Business

New Profits

The business created by "AddHere"— the revolutionary new surface extension material — is actually *new* business for the wholesaler, the contractor, and the public utility. For AddHere is not designed to replace wiring that is now being done by the legitimate electrical industry. It *is* designed to replace makeshift extensions and to give the electrical industry an opportunity to extend circuits in millions of *already wired buildings*. This means *new* business and *new* profits.

Bryant ADDHERE SURFACE EXTENSION WIRING

Circuit picked up from existing outlet by use of AddHere Frame.



End fitting for terminating run of AddHere.

Circuit can be "tapped" at any point to install this neat, compact duplex receptacle. Raceway, receptacle and all fittings available in four colors: White, Ivory, Green and Brown.

For complete information, write

The BRYANT ELECTRIC COMPANY

BRIDGEPORT, CONNECTICUT

NEW YORK CHICAGO SAN FRANCISCO

The New 35 Line of Appleton Unilets

REG. U.S. PAT. OFFICE

are Skillfully Designed

Note rounded ends and absence of ear lugs—also more wiring space.

No-Thread type in all popular styles. Sizes: ½", ¾", and 1".

Here is a new shape in Appleton Unilets that meets a wide demand. The rounded ends of the cover opening and the absence of ear lugs in the body are new features. Typical Unilet construction assures positive resistance of rust and corrosion with the cadmium finish. All Unilets are made in the Appleton foundry under careful supervision which insures smooth, perfect castings. Malleable iron is used for both strength and lightness. The 35 line comes in ½", ¾" and 1" sizes, in both Threaded and No-Thread. Write for further information.

Threaded type in all popular styles. Sizes: ½", ¾", and 1".

SOLD THROUGH JOBBERS

APPLETON ELECTRIC COMPANY
1704 Wellington Avenue, Chicago, U. S. A.
New York—76 Ninth Avenue ● Philadelphia—401 North Broad Street
San Francisco—655 Mission Street ● Los Angeles—340 Azusa Street
Detroit—7621 Woodward Avenue ● St. Louis—420 Frisco Building
Manufacturers of Appleton Constant Duty and Portable Type Reelites

APPLETON

Threaded and No-Thread Malleable

UNILETS

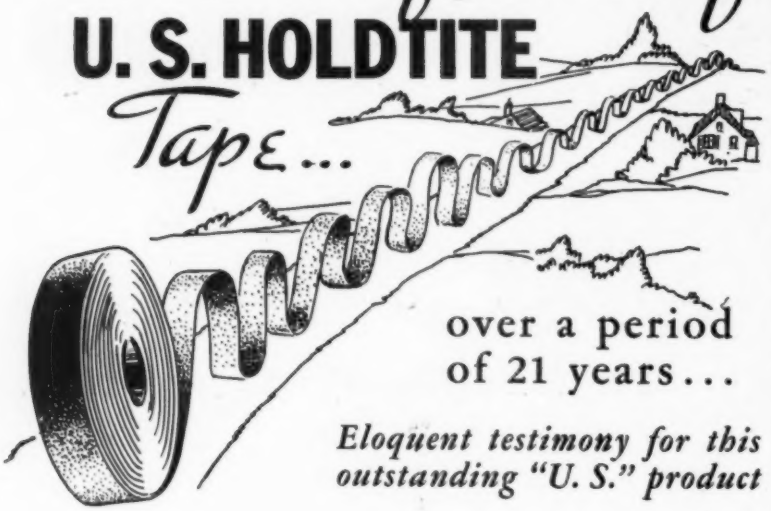
STANDARD FOR BETTER WIRING

Reg. U. S. Pat. Off.

Thousands of Miles of

U. S. HOLDTITE

Tape...

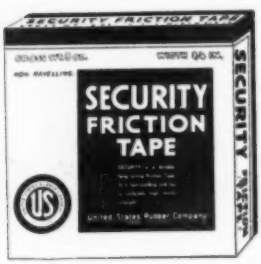


over a period of 21 years...

Eloquent testimony for this outstanding "U. S." product

FOR MORE THAN A SCORE OF YEARS "U.S." TAPE HAS FILLED THE BILL.

No matter what your friction or rubber tape requirements are, you'll always find a "U.S." tape that does the job—quickly, neatly, permanently.



These tapes are tough—have a uniformly high tensile strength—will not ravel—will not dry out. They stick and *stay* stuck. That's why they've won their fine reputation among an ever-growing number of electrical contractors.

Look for the "U.S." trademark the next time you buy tape—you'll be time and money ahead.

UNITED STATES RUBBER PRODUCTS, INC.

1790 BROADWAY, NEW YORK, N. Y.

United States Rubber Company

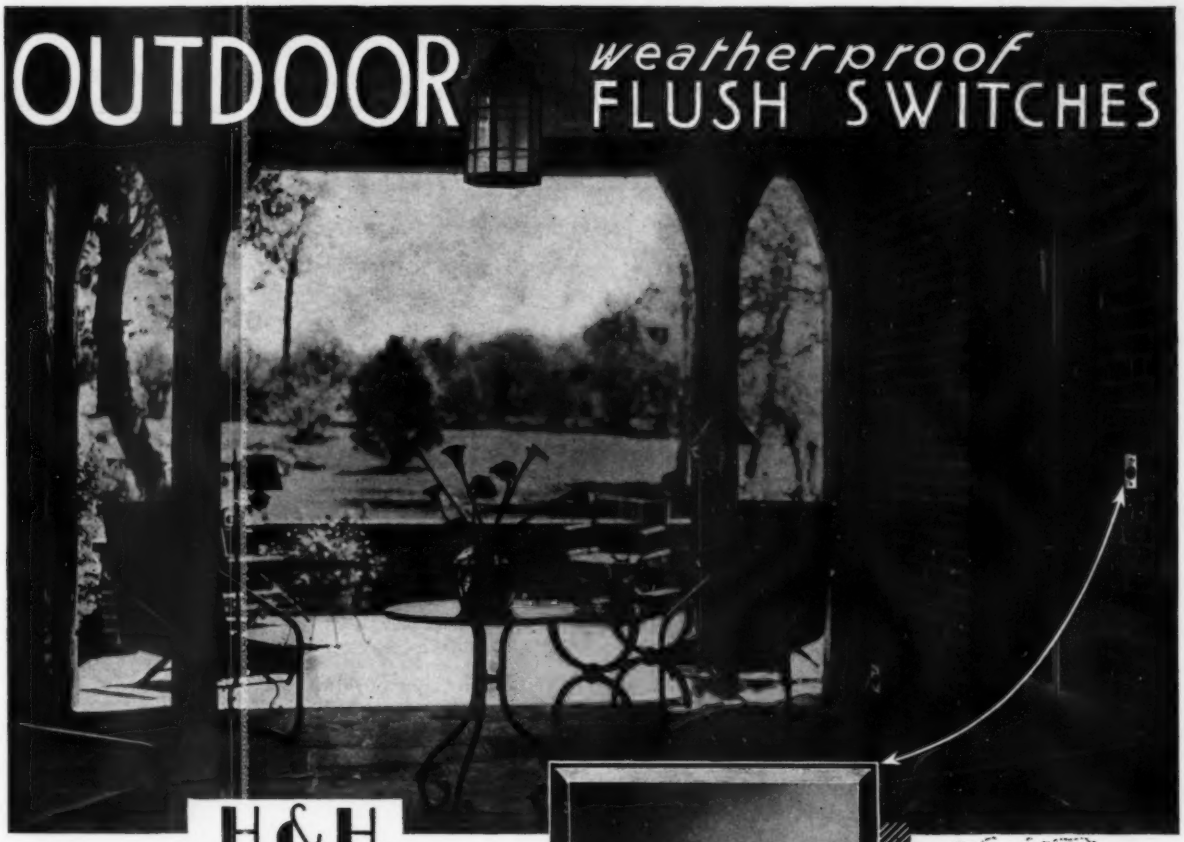
to the end of each drawer. A certain type of socket or other wiring device is thus marked by cutting an advertising illustration of the item from a catalog or trade magazine. This method takes the place of stenciling an abbreviated description upon the end of the drawer, or of fastening a sample item to the outside. When a new type or style device replaces the old stock item, a new cut-out illustration is pasted on over the old one. This method is used by the Nelson-Wood Electric Co., Roslyn, N. Y.

Outlets on Shallow-Furred Brick Walls

The "half-in, half-out" switch or receptacle outlet box which is often encountered on commercial and institutional jobs involves two distinct installation problems. The first is that of getting the conduit into the

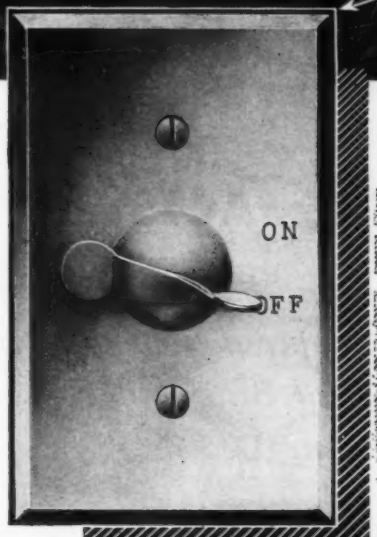
brick-work, and finally the placing and alignment of the outlet box to meet flush with the finished plaster. In wiring a new Long Island high school at Hempstead, N. Y., the Meeker Electric Co., of Williston Park, N. Y., concealed the conduits in the brick wall to within 6 in. of the box. Offsets were then made which would place the outlet box out of the brick a sufficient distance to meet the finish line. This left the box slightly recessed in the wall. Due to variations in furring the use of specially made deep boxes to avoid these conduit off-sets would have been difficult. Likewise the depth of such special boxes would have made wire pulling more cumbersome.

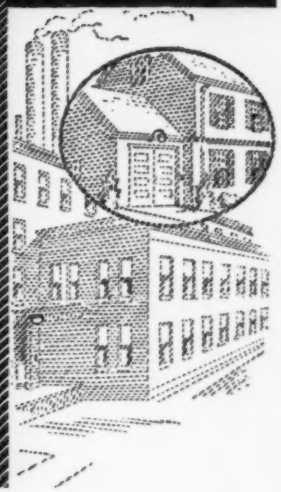
OUTDOOR *weatherproof* FLUSH SWITCHES



H&H

Make OUTDOOR Lighting Control as Convenient as Indoor





ANYWHERE that a Flush Switch must *WEATHER*, this new H & H development brings *convenient* lighting control — as convenient as your conventional *indoor* control. No mechanism is exposed to the elements or to damaging atmospheric conditions. The cadmium-finished brass plate fits over a rubber mat — weather-tight. Operated with a handy lever which points to ON and OFF positions.

The switch fits any standard wall box and is reasonably priced for inclusion in every job. Particularly to be recommended for porch lights; for installation in patios or wherever outside doors should be lighted in house or garage. Comes in single-pole, double-pole, 3-way and 4-way types.

FOR INDUSTRIAL BUILDINGS ALSO: — This weatherproof Flush Switch has current-carrying capacity for industrial-lighting uses as in yards, shipping platforms, entrances or in rooms subject to corroding atmospheric conditions. *Write us* for complete catalog data-sheet.

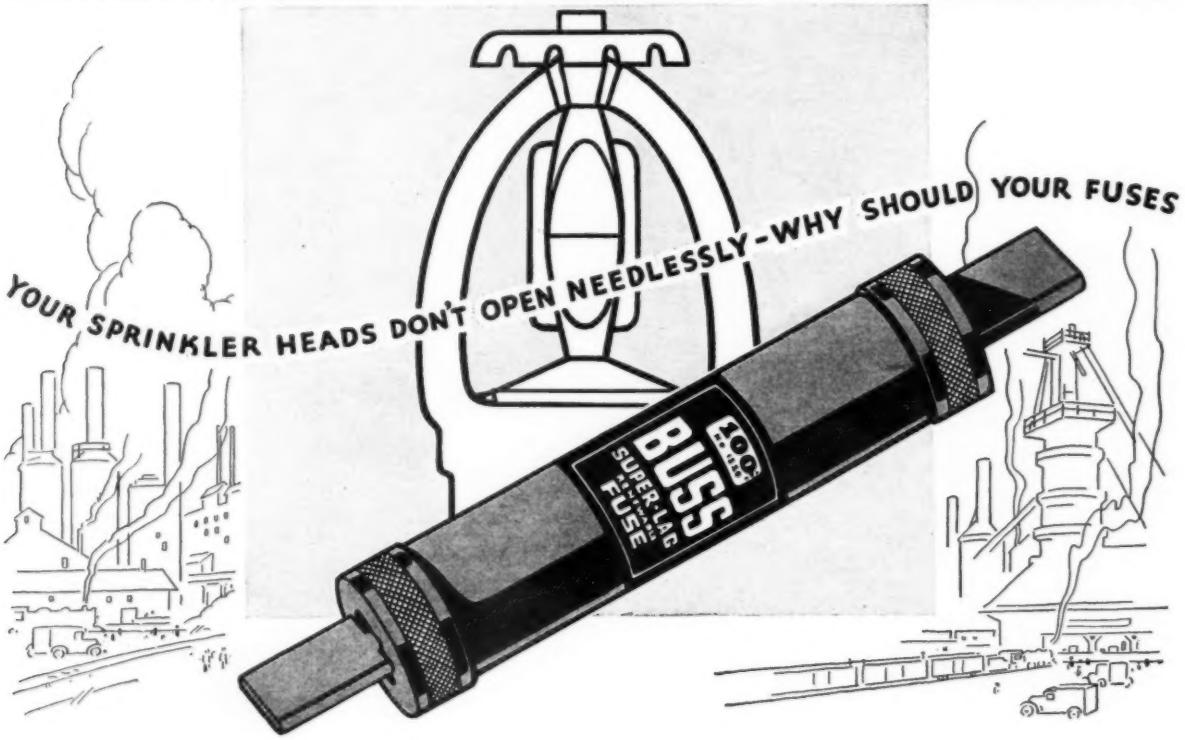
USE THESE NUMBERS WHEN ORDERING:

Catalog Number	Description	Amperes at 125 V.	Amperes at 250 V.	Std. Pkg.	Carton	Pkg. Wgt.
7981	Single Pole	10	5	10	2	7
7982	Double Pole		10	10	2	7
7983	Three-way	10	5	10	2	7
7984	Four-way	5	2	5	2	4

HART & HEGEMAN DIVISION
THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD. CONN.

UMI

FUSES MADE TO PROTECT · NOT TO BLOW



GET THE FACTS—"*We have been having considerable expense blowing an average of one to two 500 ampere fuses per day on the compressor pumps. On Oct. 28th installed BUSS Super-Lag Fuses and have not had a blow to date (Dec. 16th)...We are BUSS boosters from now on.*"

Mr. B. Pomeroy speaking, *Master Mechanic* of the VIERLING STEEL WORKS, Chicago. His present fuses are *Made to Protect* . . . NOT TO BLOW.

The "considerable expense" referred to was not the comparatively small fuse expense...but that real, considerable and riotously wasteful expense in any factory...which is

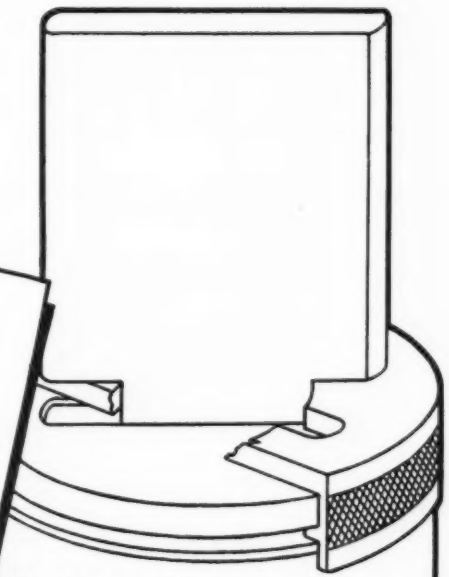
. . . the RECURRING SHUTDOWNS *caused by* NEEDLESS BLOWS

"Inadequate" is a polite word for a fuse-case that creates self-built hazards and that forces the terminals to heat up sufficiently to blow ANY link. And that is but one of MANY causes of the recurring, needless shutdowns that repeatedly raid your earnings. Investigate . . . . . .

WHY BUSS FUSES DON'T BLOW NEEDLESSLY

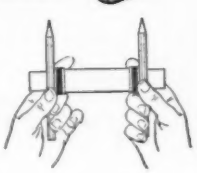
10 Features in the design of the FUSE-CASE help make it possible and . . . .

The Super-Lag development in the FUSE LINK completes the job.



Try this on the terminals of a BUSS fuse.

NOTE HOW THEY LINE UP



ALWAYS LIKE THIS

NEVER LIKE THIS

They are locked — you can't twist them out of line.

Now try this test on other fuses.

* * *

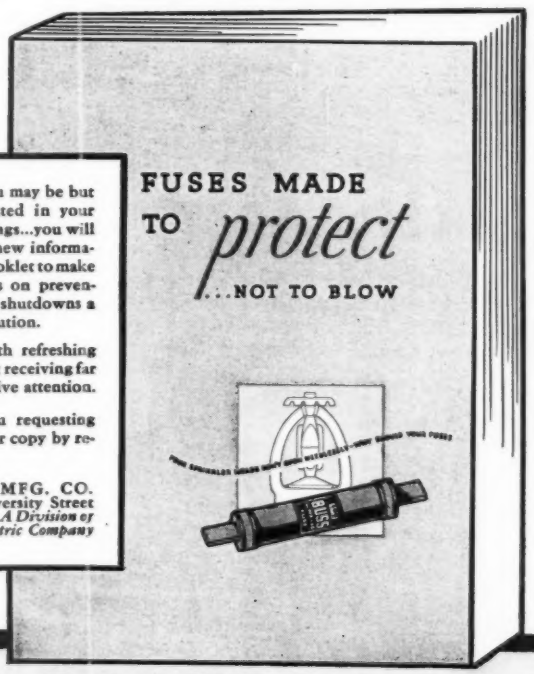
Comparisons may be odious — but this one is OBVIOUS.

Isn't it obvious that unless the terminals of your fuse are in perfect alignment you will not get good contact?

Isn't it obvious that where contact is bad heating must occur — and the poor *self-heated* fuse soon thinks it is handling a dangerous overload—and BLOWS — NEEDLESSLY — exacting from you the *surtax* of a shutdown?

And isn't it obvious that the troubles that blow fuses should originate in circuits, not in fuses?

GET THE FACTS



Even though you may be but remotely interested in your company's earnings...you will obtain enough new information from this booklet to make your suggestions on prevention of needless shutdowns a valuable contribution.

It is replete with refreshing facts on a subject receiving far too little executive attention.

A line from you requesting it, will bring your copy by return mail.

BUSSMANN MFG. CO.
2536 West University Street
St. Louis, Mo. . . . *A Division of the McGraw Electric Company*

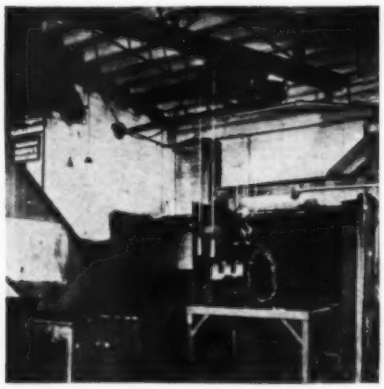
BUSS super-lag FUSES

UMI

Service Shop . . . Practice . . . . . .

One-Man Layout for Dipping and Baking Large Equipment

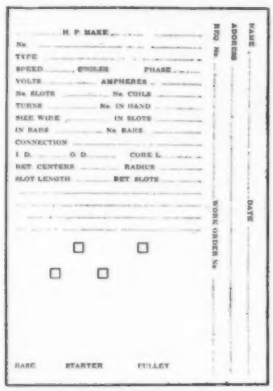
The baking oven and dipping tank layout of the Roland Electrical Company, Baltimore, Md., permits one man to handle large equipment that



is to be dipped and baked. An overhead track which leads from the oven door to the truck type dipping tank space is equipped with a ½-ton movable electric hoist. A double-decked steel frame truck permits two levels of equipment to be racked up for one baking operation.

Initial Transaction Record

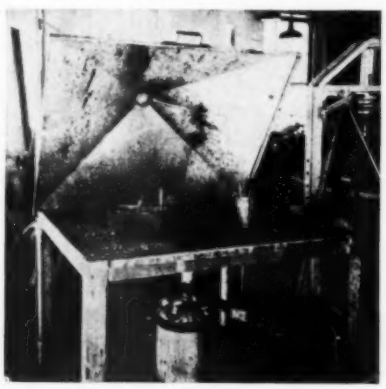
When a repair order is received by the Wolff Electric Works, Portland, Ore., whether by mail or telephone, a special card record is immediately made covering the operations involved. Thus if an inspection and estimate is first required, this card, bearing the customer's name and address, has entered thereon all initial instructions that may ensue prior to starting work. Thus a definite office record is kept available pending an ok. to proceed. When work is commenced this same card goes to the shop, after a number has been assigned to it. It becomes the official shop order from which requisitions and time tickets are made up during the course of repairs. Jobs which come in for immediate procedure likewise are routed into production by this card. During the progress of repairs the



essential description of the equipment and of repairs required are entered upon this card for the permanent office data files. These cards are 6 in. wide and 4 in. high. They are blank on one side, thus providing space for making any notes for which there is not enough blank space on the front.

Cleaning Rack

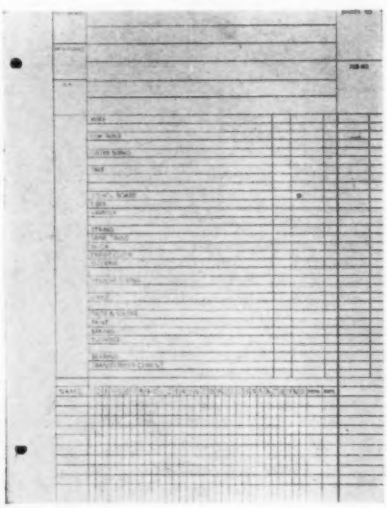
A cleaning rack capable of supporting 1,800 lbs. load was built by the Warren & Bigelow Electric Company, Worcester, Mass., for removing grease and oil from apparatus being repaired. Workmen



can place their equipment upon its heavy mesh platform and apply gasoline with brushes or with air pressure sprays, until the equipment has been suitably cleaned. The residue drains into a safety can below after it is strained through a series of screens to catch all possible sediment. A counter-weighted cover fits over the entire rack when it is not in use. This rack was made 32 in. high, 50 in. wide and 40 in. deep, with four legs made of 3-in. by 3-in. angle irons supporting a 1½-in. angle iron frame. This frame carries a series of screens and an outlet or drain nozzle at the bottom. A heavy steel mesh top rests on a removable section of fire escape grating. Below this grating is a layer of standard window screen, then a finer layer, and last a mesh similar to that used for milk straining. A safety can of 5-gal. capacity is connected by means of a gasketted union to the drain basin nozzle.

Condensed Job Record Form

A ruled form upon which both labor and materials may be entered from shop time cards and material tickets is used as a permanent record sheet by the Wolff Electric Works, Portland, Ore. These forms are



standard 8½-in. by 11-in. letter size, and are punched for placing in post binders in consecutive order, according to shop numbers. There are twenty common types of shop material printed on this form as posting reminders, with eleven blank line spaces for filling in miscellaneous items. The labor section at the bottom of this form provides posting space for nine shop men during an entire month. When a completed repair

Ready-wired molding is cemented to the wall with special AddHere cement. No tacks, nails or screws.

AddHere Pendant "taps" the run near the ceiling with a special fitting, firmly anchored in place.

Seven-foot Pendant, with three-way convenience outlet, is available in attractive colors. White, Ivory, Tan, Gold, Peach, Green.

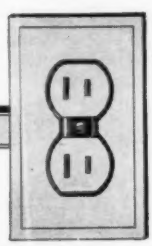
New Business

New Profits

The business created by "AddHere"— the revolutionary new surface extension material — is actually *new* business for the wholesaler, the contractor, and the public utility. For AddHere is not designed to replace wiring that is now being done by the legitimate electrical industry. It *is* designed to replace makeshift extensions and to give the electrical industry an opportunity to extend circuits in millions of *already wired buildings*. This means *new* business and *new* profits.

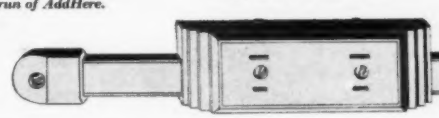
Bryant ADDHERE SURFACE EXTENSION WIRING

Circuit picked up from existing outlet by use of AddHere Frame.



End fitting for terminating run of AddHere.

Circuit can be "tapped" at any point to install this neat, compact duplex receptacle. Raceway, receptacle and all fittings available in four colors: White, Ivory, Green and Brown.



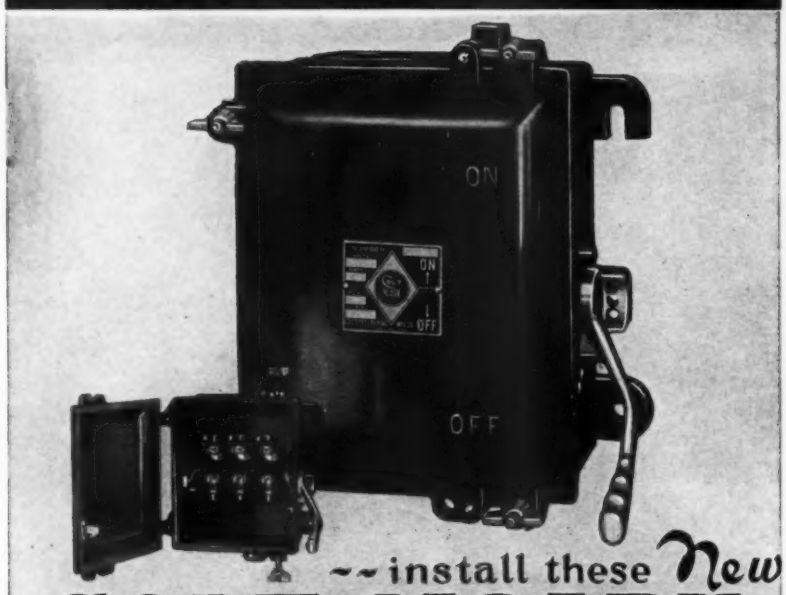
For complete information, write

The BRYANT ELECTRIC COMPANY

BRIDGEPORT, CONNECTICUT

NEW YORK CHICAGO SAN FRANCISCO

WHEREVER LIFE FOR A SAFETY SWITCH IS *TOUGH*



~~install these *New*

COLT-NOARK

Dust Proof and Weatherproof Switches

These new Type "A" Colt-Noark Weatherproof switches are rain proof and dust tight — built to stand up under the most severe outdoor and indoor conditions — moisture, flour dust, cement and coal dust, dirt, lint and fumes. Cased in a rugged cast iron box — the safety switch within is completely sealed — a *super-safety* switching unit.

They're Brutes for Punishment

TYPE "A"
Dualbreak Switches

Type "A" 575 Volt Dualbreak Switches are now available in these new cast iron cases, equipped with quick-make and quick-break mechanism and safety cover interlock. All are full H.P. rated. 30 to 200 amperes—fusible and non-fusible. This switch mechanism is ideal for both outdoor and indoor locations — simple, dependable and rugged.

The covers of these cast iron boxes are bolted to the cases with extra heavy corrosion proof eye-bolts and wing nuts — the bolts on the left side acting as cover hinges. The operating handle is furnished with dust-tight bearing — with opening in handle and case for padlocking. A soft rubber gasket is located between the cover and the case. Tapped holes are drilled in both top and bottom for conduit — with extra holes plugged with heavy pipe plugs. Cover easily opened for inspection and replacement of fuses — and generous wiring space is provided as in all Colt-Noark switches.

. . . . . **Get This**

A special edition of the Colt-Noark catalog has just been printed. Full description of safety switches — meter service switches — motor starters. Your copy is ready.

ELECTRICAL DIVISION
COLT'S PATENT FIRE ARMS MFG. CO., HARTFORD, CONN.
Boston, New York, Chicago and Philadelphia. H. B. Squires Co., Pacific Coast Representative

COLT-NOARK

SWITCHES - MOTOR STARTERS - FUSES

job has been posted to this form it provides a compact permanent record for future reference.

Crane Equipment in Narrow Shops

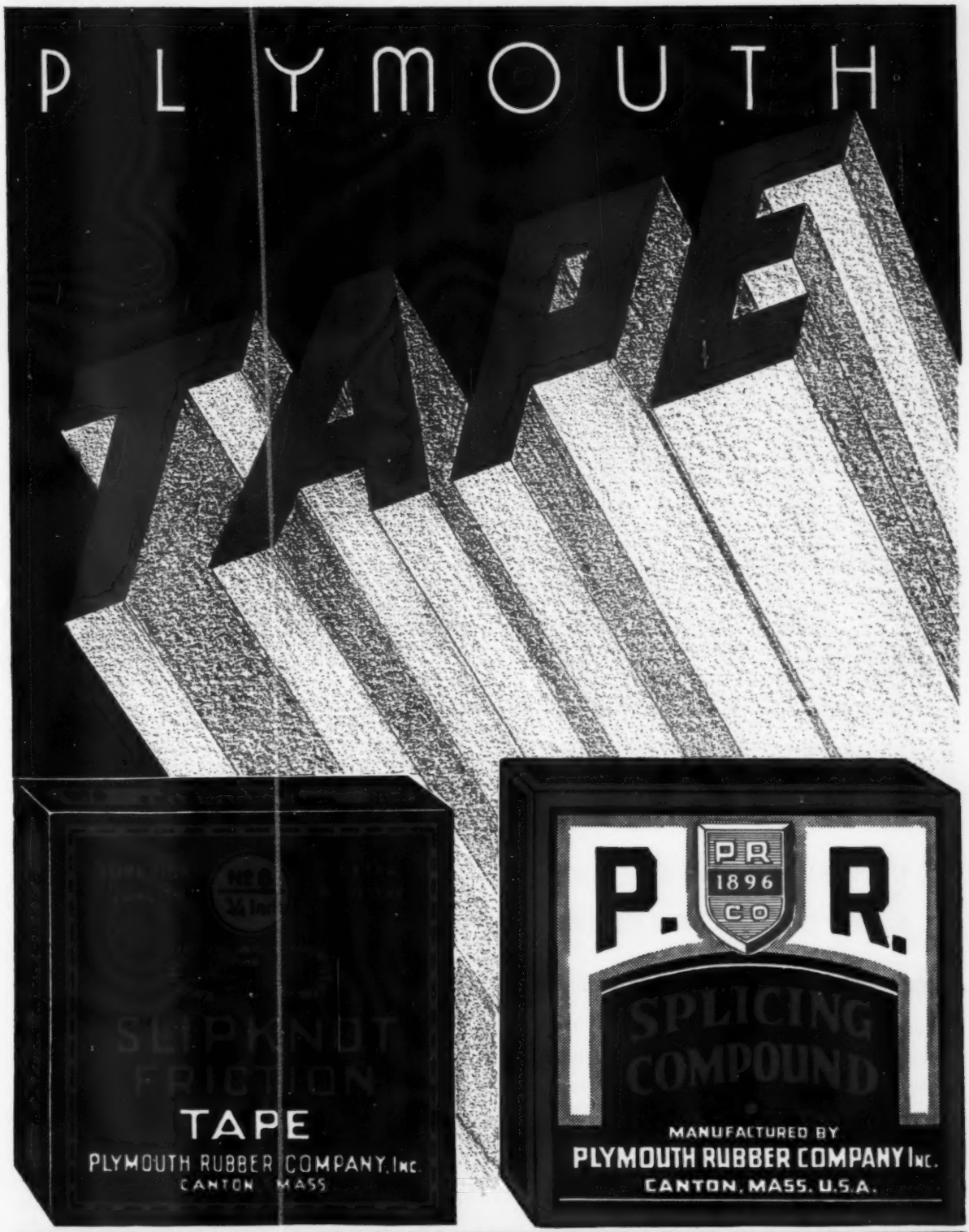
A bridge type overhead crane was installed by the Industrial Electrical Construction Company, York, Pa., to provide hoisting facilities that would

be available for the entire length and width of the first floor. The building is narrow and has the receiving doors at the front end of the shop, with the oven at the rear end. By providing vertical steel supports along the outer walls, a rigid lengthwise track was installed which permits this crane to be used for handling heavy equipment at all parts of the first floor area.

Welding Rotors Out-of-Doors

The compact shop arrangement of Venino Bros. & Co., Inc., Newark, N. J., makes it desirable to isolate rotor welding jobs from the other workmen. During moderate weather such work is done under the loading

dock canopy. This isolates the welder from the other mechanics, prevents the unnecessary generation of heat and welding gases in the shop, and

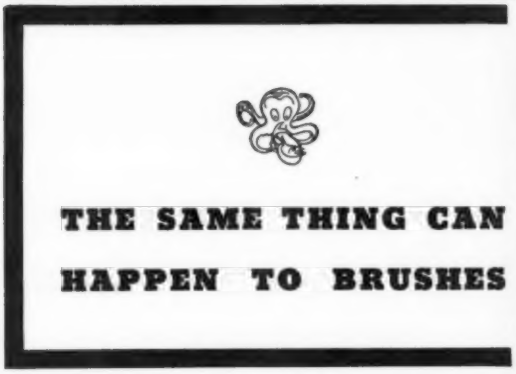


Manufacturers
Since 1896

PLYMOUTH RUBBER COMPANY, Inc.
CANTON, » » MASSACHUSETTS

UMI

Actual Size
5/8" Thick
McGILL
THIN MODEL
Levolier
No. 41
6 Amp.
The Levolier Thin model Switch No. 41 is an achievement in small switches. The above actual size picture shows it is not over ⅝ of an inch in thickness. In spite of its smallness, it retains all of the practical characteristics of the famous Levolier line. It is the smallest 6 amp. switch made.
At the left are shown six logical uses for this practical Levolier, which may be secured in three different stem lengths. You'll make no mistake in ordering these Levolier Thin Model Switches.
McGILL
MANUFACTURING CO.
Electrical Specialties of Quality
ESTABLISHED 1904
VALPARAISO · INDIANA
Box No. 670



Where a vacuum effect occurs, it will vary under different conditions and is the result of the lack of air circulation under the brush.

There are helpful suggestions for this condition in the "The Brush Phase of Motor Maintenance" which we believe will be a valuable addition to your library . . . no charge of course . . . just send the coupon.

THE OHIO CARBON COMPANY
12508 Berea Road — Cleveland, Ohio

THE OHIO CARBON COMPANY
12508 Berea Rd., Cleveland, O.
Please send free copy of booklet "The Brush Phase of Motor Maintenance."
Name_____
Company_____
Address_____

provides a cool, shady place for this work to be performed under ideally lighted conditions.

An Industrial Tool Service Depot

The servicing of small electric tools such as drills, hammers, grinders, etc., involves the stocking of genuine parts and keeping them in good order for quick installation,

often while a customer waits for the job. In handling such specialty work so as to keep this phase of the business away from heavier motor work, Geo. M. Jones, Scranton, Pa., provided a separate space in charge of a special mechanic. All parts for various models of this equipment are kept in labeled jars and drawers, apart from heavier stock items. A small bench lathe, testing panel and 6-ft. workbench are railed off for this separate department, thus there can be no interference from other jobs.

7/8th Time Saved in Undercutting

A 48-man-hour commutator undercutting job was recently done in 6 hours with the use of a mechanical undercutting outfit, according to A. Traver of the Electric Motor Repair Company, Inc., Waterbury, Conn. A 300 k.w. generator in a local plant had always been shut down each year for having its commutator reconditioned. This work had always averaged about forty-eight hours' time, until Mr. Traver purchased the undercutting outfit. This job was then given to his company with the foregoing economies in generator shut-

FORM S 121

SCHEDULE SHEET

DEPARTMENT *Stamping* DATE *3-5-1935*

Part Number	Quantity	Raw Materials	Work Completed
28-151	6,000	20 gauge Copper-Bearing Steel	4,160
29-601	10,000	32 gauge 18+8 Stainless	1,123
7-708	5,000	18 ga[illegible] Cold Rolled	5,000
8-607	1,000	16 [illegible]pper	603
18-116	5,000	16 gauge Copper	5,000
20-115	10,000	32 gauge Cold Rolled	2,160
19-172	6,000	18 gauge Hot Rolled Annealed	5,106
27-151	5,000	32 gauge 18+8 Stainless	5,000
31-161	10,000	18 gauge Hot Rolled Annealed	3,132

Show Customers How to Modernize and Eliminate STOPPED Time in Their Plants

The secret of Jefferson Super-Lag performance is in the lag plate on the Super-Lag link. This plate delays the normal fuse action, provides a time interval or lag by absorbing temporary heat rise. This time-lag prevents the fuse from blowing on harmless temporary overloads—saves needless STOPPED time and link replacements.

Modern Jefferson Super-Lag Fuses eliminate "stopped" time, idle motors and machines—because they do not blow the moment current rises—do not stop the motor if the overload is only temporary. But they operate positively before the overload has time to become dangerous. It is this "wait" which gives the motor a chance to recover speed—which eliminates needless STOPPED TIME.

Modernize Your Fuse Equipment

Use today's time-saving fuses for all your electrical equipment—and stop wasted "time outs". Jefferson Renewable Super-Lag Fuses are made in all capacities —knife blade and ferrule contact types.

Fuse Chart—FREE—A handy guide to selection of proper size fuses at a glance, for the adequate protection of motors. Ask for Fuse Chart No. 18.

JEFFERSON ELECTRIC COMPANY
BELLWOOD (Suburb of Chicago) ILLINOIS
Canadian Factory: 535 College Street, Toronto

JEFFERSON
Super-Lag RENEWABLE **FUSES**

UMI

46 YEARS

OF KNOWING HOW IN EVERY FOOT OF

CRESCENT

insulated wire and cable

TRADE

PEARL

BUILDING WIRE
RUBBER SHEATHED CORDS
SIGNAL CABLES
CONTROL CABLES
LEAD COVERED
VARNISHED CAMBRIC
PARKWAY CABLES
FLEXIBLE CORDS
WEATHERPROOF WIRE
MAGNET WIRE
and all kinds of Special Cables to meet A.S.T.M., A.R.A., all R.R., Gov't and Utility Co's specifications.

CRESCENT
INSULATED WIRE & CABLE CO.
TRENTON, NEW JERSEY

down time, and in greatly lessened hourly charges. A charge of 50 cents per hour is made for the machine, in addition to the shop-man's time.

Motor Sales Record Card

The used motors which are sold by the Roland Electrical Company, Baltimore, Md., are separately recorded upon detailed specification

SOLD TO				DATE
H. P.	SPEED	TYPE	VOLTS	MAKE
A.C.-D.C.	FRAME	PHASE	CYCLES	NUMBER
POLES	FORM	PULLY	STARTER	WINDING
SIZE SHAFT	KEY-WAY	BASE	RAILS	
PRICE				
REMARKS				
BOUGHT FROM				COST

cards. These cards are 6 in. wide and 4 in. high, and provide ruled spaces for inserting nineteen items of descriptive detail, together with the name and date of purchase, seling price, from whom bought, cost, and space for special remarks.

Separate Benches Avoid Eye Strain

Bright sunlight does not shine directly upon the work benches in J. C. Neuhauser's shop at Lancaster, Pa., because the benches are placed

at right angles to the outside walls. Although good diffused sunlight floods these benches, there is no direct glare or sharp reflections from bright metal objects to cause eye fatigue to the workmen. This arrangement also makes more efficient use of floor space than a layout of continuous wall benches.

OLD CHAIN BRIDGE

1810

BUILT in 1810 and still in use . . . attesting to ruggedness in construction, and correctness of design.

★

SHAWMUT LAG RENEWABLE FUSES

. . . are correct in design and rugged in construction and provide greater time lag than ordinary fuses under unusual overload conditions.

★

For RENEWABLE FUSE design, construction, and performance ask your jobber for SHAWMUT LAG RENEWABLE FUSES.

★

UND. LAB. APPROV.

THE CHASE-SHAWMUT CO.
Newburyport, Mass.

Fuse Specialists Since 1893

. . . . . you get more features with F-M Motors

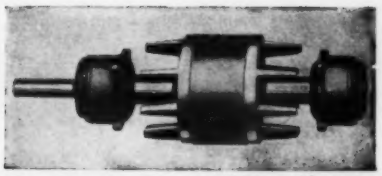
The best product wins! Today, purchasers are exacting—they scrutinize values. Features count heavily. The more outstanding features contributing to longer life, the better your chances of selling a motor.

You get more when you sell or recommend the installation of F-M Motors. A long list of F-M proven and accepted features substantiate your judgment in their selection.

These motors meet the most exacting electrical specifications. But with characteristic thoroughness, Fairbanks-Morse has achieved a position of leadership in mechanical construction.

Fairbanks-Morse pioneered mechanical excellence in electric motors. It pioneered ball bearings, grease tube lubrication, one-piece rotor construction.

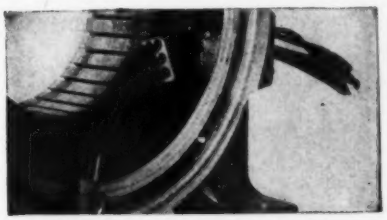
Pioneers in motor building progress, Fairbanks-Morse asks only an investigation of how much more these motors have to offer. Start your investigations by writing for full information. Address Fairbanks, Morse & Co., 900 S. Wabash Avenue, Chicago, Ill.



Complete rotor assembly with cartridge-type sealed ball bearings. Note rotor winding is of one-piece construction.

Lubricate sealed ball bearings once a year with tube contained lubricant. Bearings are dust tight. No lubrication drip.

Group wound coils—an entire phase group in a single piece of wire—lead connections from each group *welded*, not soldered or brazed.



Sealed-in leads through frame opening—anchored permanently. No chance for strain on field leads.

Slot insulation—self locking by means of cuff construction — permanent and additional protection for field windings.

Final vibrometer test —one of a series to insure a smooth running motor with minimum vibration.

Pioneer Designers and Manufacturers of POWER, PUMPING AND WEIGHING EQUIPMENT 105 Years

FAIRBANKS-MORSE
MOTORS

9085-PA40.61

CONTRACTORS—STOP GUESSING!

In these days of reduced office help and constantly changing costs, it is almost impossible for any individual to keep abreast of the price changes on the thousands of items used in the electrical business, yet every *guess* on prices is a *bad guess*—a probable source of loss.

NATIONAL PRICE SERVICE RESALE PRICES

A PROFITABLE INVESTMENT FOR EVERY CONTRACTOR

It's time to get back to fundamentals — to common-sense truths from which we should never have strayed!

Many Contractors seem to think that by increasing their volume of business they automatically add to their profits. It is human to strive for more business but in planning for the future contractors should not place too much dependence upon increased volume as the sole producer of PROFITS—consistent profits on the volume of business obtainable is a safer way to progress.

Today as you read this hundreds of successful Contractors and Dealers of every kind and size depend upon the NATIONAL RESALE PRICE SERVICE as a safe guide to fair prices and profits —fair to themselves as well as their customers.

If the NATIONAL RESALE PRICE SERVICE were a new and untried Service, you might be skeptical of its value. The fact that it has been recognized for years as an unbiased authority on Resale Prices for Electrical Contractors and Dealers offers convincing proof that you will not be experimenting by accepting it as your "Silent Partner."

A partner who will work every hour of the day, every day in the week without complaint helping you to build a profitable business. Many Contractors tell us that this Service adapts itself to their needs as well as anyone they might hire to do the same work—and for a fraction of the cost.

Don't dismiss the possibilities of this unusual service until you have investigated. We will gladly send full particulars and sample sheets without obligation, of course. Please attach the coupon to your letterhead as the Service is furnished only to those actively engaged in the business.

HENDERSON-HAZEL CORPORATION
5005 Euclid Avenue, Cleveland, Ohio

Without obligation, please send us full particulars about the NATIONAL RESALE PRICE SERVICE.

NAME _____

ADDRESS _____

CITY OR TOWN _____

STATE _____ EC-10-35

HENDERSON-HAZEL CORPORATION

5005 EUCLID AVENUE **CLEVELAND, OHIO**

UMI

ELECTRICAL CONTRACTING

S. B. WILLIAMS, Editor

A New Program

THE convention of the National Electrical Contractors Association in Chicago last month was a critical time for the Association. The figures showed that the membership at the present levels could not sustain even the depression budget. While there exists a healthy surplus, it is not sufficient to last many years with the present annual deficits.

Many at the convention expressed the opinion that the Association was either going forward or it was going to cease altogether. There was no question about the need for a National Association, only how was it to operate?

To build a good healthy organization there must be a strong representative membership and to secure more members there must be something in the association's activities that will attract. After all, a trade association is not like a fraternal organization. For the most part, members do not join for social privileges or pride, but because they are going to get something out of it.

A program therefore is necessary. A program that will attract members and arouse enthusiasm.

One such program was offered and seemed to catch the interest of the convention at least to the point where it is being carefully studied by the Executive Committee. The proposed program being based upon securing adequate differentials for the contractor over the consumer, at least offers something of tangible value to every contractor. The end to be achieved is something every contractor has longed for. Moreover, it is doubtful if the contractors could secure the recognition they desire without some such solid form of organization.

Even if the program is not 100 per cent successful—and no plan ever is—it should accomplish something, even if nothing more than arousing the contractors from their dejection.

Adequate Wiring

WHAT is holding back adequate wiring? The industry as a whole seems very apathetic. Why?

A committee representing all of the national electrical associations has decided to build a handbook on adequate wiring for distribution largely to architects. A few years ago a similar committee sponsored the preparation of adequate wiring standards for residences.

Both of these efforts are fundamental and therefore necessary, but they are very much like a fine highway which is useless unless someone travels over it. In other words, will this handbook, when completed and distributed to the architects, be forgotten by the industry as were the residential standards?

When the promotion of an activity such as adequate wiring means so much to the industry, there must be some explanation for such seeming lack of interest. Undoubtedly the elements of distrust and suspicion engendered by differences of opinion with respect to National Electrical Code policy still haunt the industry, but even so it ought to be possible for the different interests to reach a mutually satisfactory understanding.

Is not the real explanation to be found in the lack of some promotional organization that can take the initiative?

Service Shop Organization

It was gratifying to find a number of the leaders of the National Industrial Service Association present at the N.E.C.A. Convention. There is so much that the National Motor Section and N.I.S.A. have in common that it would seem as though more could be accomplished by a community of effort and purpose than by each trying to go its own way alone.

The necessity for a separate organization for service shops is not the same today as it was when NRA codes were in force, and labor provisions made it necessary for the shop men to demonstrate that they had a different labor problem from those in construction work.

Inasmuch, however, as there are more shops numerically that are part of a contracting organization than are independent, it does seem as though the very economics of the situation would cause the shop men to find a way to weld the two organizations into a single body that would be of maximum benefit to the entire service industry.

The National Motor Section, N.E.C.A., could, with the larger and more united membership, do things that it has not yet tried to do. It could do them more economically, because the Association is in a position to carry on the work with its present office and clerical overhead. A field man or section secretary might be advisable to handle the technical phases of the industry's problems, but that is something neither group could do acting independently.

The officers of N.I.S.A. have done remarkably well on the small amount of money so far made available, and because they are so concerned with the welfare of the industry, and are willing to make such personal sacrifices as they have, it perhaps is not presumptuous to believe that they will urge the merger of the two groups the moment they are convinced of the advantages to their industry.

—◇—

Voluntary Agreements

There is an old adage that you never really appreciate anything fully until you have lost it. That seems to be running true to form in the matter of industry self-regulation.

For almost a year the electrical contractors, as a division of the construction industry, operated under a code of fair practice. And while this code probably performed better than any other construction industry code, its administrators were nevertheless convinced finally that it could not be made to work. When the Supreme Court rendered all codes inoperative, electrical contractors, like many other industries, had a jolt. All of the bad practices known before the Code, and a lot more born in the minds of chiselling code offenders, made competition in an unregulated industry a thing to be dreaded.

The turn now is decidedly in favor of regulation. Electrical contractors in a number of cities have drawn up voluntary agreements and a number of other cities are considering similar plans. Leaders of the industry unhesitantly state that only by self-imposed regulation can the industry survive. It is obvious that little is to be gained from the Federal Trade Commission, and it is equally obvious that the federal government is in no position to enforce industry regulations, except possibly in interstate commerce. There must, therefore, be local voluntary regulation.

Wiring Policy

For years the electrical contractor has been accused of standing in the path of progress and demanding that improvements and new methods which would lessen the cost of wiring be prohibited. It is true that the National Electrical Contractors Association did have some years ago a policy of all-metal wiring. That policy, however, was later abandoned.

Because of the general impression that the contractors were a retarding influence, the N.E.C.A. deemed it advisable at its convention last month to state unequivocally the position of the Association and of the electrical contractor, with respect to wiring standards. The Association has thereby gone on record as favoring the progressive development of wiring to the point that electric service may be made as wide in use as possible, provided the safety and convenience of the public is not forgotten. In other words, N.E.C.A. takes the position that the electrical contractor believes that his best interests will be served as the public is better served, and that the wider the use of electricity, the larger will be the contractor's business opportunities. If this wider use can be attained through the introduction of new and inexpensive methods, then the electrical contractor will look forward to their introduction provided they can pass the industry's standards.

In making this declaration, it is unfortunate perhaps that the Association confined its statement entirely to the matter of wiring standards policy, because in spite of the clarity of statement, it is possible that certain prejudiced interests might take this declaration to mean the admission that wiring is too expensive, and that lower cost wiring is necessary. While such, of course, was never in the minds of the drafters of the Association's policy, it is to be regretted that the declaration did not take the opportunity to state that wider use of electric service could be had with present wiring systems, provided more help were given by the rest of the industry in the matter of wiring sales promotion.

While the Association is to be congratulated on clearing its branch of the industry of the stigma of obstructionism, it should never lose the opportunity to urge upon the industry consideration of the fact that was so thoroughly demonstrated at the time of the Wiring Sales Conference; namely, that it is not the price of wiring that is the retarding influence, so much as the lack of selling.

UMI

Contracting .... News .....

President Peak Announces N.E.C.A. Program

Following a meeting of the Executive Committee of the National Electrical Contractors Association, at the close of the recent Chicago Convention, President Earl N. Peak, made the following statement:

"Pursuant to the resolution adopted at the convention, a special committee has been appointed to carry on to a successful conclusion the attainment of more economic methods of distribution of electrical installation materials, this committee to be backed by the full resources of the N.E.C.A.

"The N.E.C.A. Convention reaffirmed as its distribution policy objective the recognition of the economic trade channels as being from manufacturer to wholesaler to contractor to consumer.

"Instructions have been given to this committee, under the chairmanship of Ralph M. Walker, of Atlanta, Ga., to put into operation plans for the development of the contractor branch of the industry as a more effective marketing agency, and to confer with manufacturer and wholesaler interests regarding the best methods of industry cooperation."

Sanitary Engineers Protest Bare Neutral Wiring

The American Society of Sanitary Engineering has recently sent to Chairman A. R. Small of the Electrical Committee, N.F.P.A., a resolution passed at its recent convention, protesting the action of the committee in permitting further trial installations of bare neutral wiring in buildings.

In the letter of transmittal it was stated:

"This Society is opposed to any wiring practice that will permit the flow of current over the piping systems in buildings.

"Will you please call our protest to the attention of the members of your committee. Both sides of the controversy admit the existence of substantial stray currents over pipe systems and other metallic building structures. Additional trial installations are, therefore, not required. We feel that the existence of these stray currents under wiring practices sanctioned by your committee is a serious criticism of your work, and that you should take immediate steps to rectify this situation, rather than to permit it to become worse."

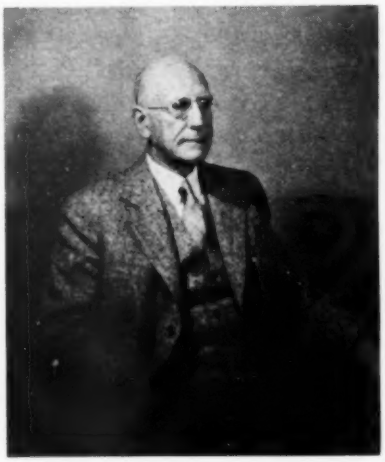
Salt Lake Drafts Voluntary Agreement

A fair trade practice agreement has been entered into by the electrical contractors of Salt Lake City, Utah, under the State Industrial Recovery Act. The agreement must be signed by four-fifths of the licensed contractors of the city and shall continue until June 13, 1937.

The labor provisions are the union agreement.

A central bid depository is provided for with registration of bids of $25.00 or more and a two hours' freezing time. The bid depository fee is one-half of one per cent of the job price. Unsuccessful bidders will receive a 90 per cent refund.

The agreement will be administered by a committee of five.



Pioneer Visits Convention: They took "time out" during the N.E.C.A. convention to introduce a charter member visitor and former executive committeeman now retired since 1911 from the electrical contracting business. Arthur Frantzen started a business at Chicago, Ill., bearing his name way back in 1894. During a part of this time he operated offices at Baltimore, Md., Des Moines, Ia., and Mexico City. Wm. McGuineas, president of the Chicago association, was recalled by Mr. Frantzen as having been manager of the Baltimore office for a time. A strange coincidence was that the meeting place chosen for the 1935 convention, the LaSalle Hotel, was wired by the Arthur Frantzen Company. Another place wired by this company that is known to Chicago visitors is the huge City and County building.

An Inspectors' Joint Committee Sought by Power Group

Appearing before the annual convention of I.A.E.I., Western Section, at St. Louis, Mo., on September 16, C. E. Michel, vice-president of the Union Electric Light & Power Company of St. Louis, suggested the appointment of a committee of inspectors to sit down with a similar committee from the light and power group for the purpose of going over the various code matters that have been under discussion. Mr. Michel stated that public evasion resulted from severe or unreasonable regulations, causing a greater number of "bootleg" or amateur wiring makeshifts. Wiring of a type which is too expensive to be within the customer's reach was claimed to be a serious obstacle to what Mr. Michel termed the "consumption era" in the light and power industry's history.

Babbitt Heads Michigan State Inspections

Michigan's recently enacted law which provides for statewide inspections and the licensing of electricians and contractors, became effective September 23. This new law will be administered under the direction of A. T. Babbitt, who was made chief inspector for the state. Mr. Babbitt is well known in Michigan for his Code school work and as a former member of the Michigan Inspection Bureau staff.

Three classes of licenses are provided in the new law. Electrical contractors compose two license classes, one paying $25.00 per year, and a second class paying $5.00 per year; the latter applying only to those contractors having no electrical journeymen in their employ, and not located in a municipality having its own license ordinance. A third class at $1.00 per year covers electrical journeymen. License fees that are derived from municipalities where there is an established inspection authority are to be equally shared between that city and the general fund of the state.

Inspection areas are being set up which will permit established inspection forces to expand their operations to surrounding suburban localities. All areas which cannot reasonably be served by such expansion will be assigned to the necessary number of districts in charge of deputy state inspectors. Fee schedules are expected to make this work self-supporting under either plan of operation.

Each licensed contractor will be

Prove SANGAMO *Value*

Sangamo has consistently claimed that Sangamo Time Switches are the finest made — that they are everything that precision workmanship and the highest quality materials could make them.

But you have only our word for this. We want YOU to put Sangamo Time Switches under the microscope — to see for yourself the quality and dependability that is built into the compact sturdy mechanisms.

Then you'll know why Sangamo is best for you and your customers to use. There are accurate, trouble-free Sangamos for every service that requires a time switch.

Form K — A high grade synchronous time switch at a minimum price to control all operations where no automatic variations are required from the regular sequence for which they are arranged.

Three adjustable "on" and "off" operations daily are provided.

Sangamo Form VW Time Switch, electrically wound, with 10 hour reserve, moderately priced, dependable. Obtainable for any commercial frequency. Sunday or Holiday Cut-out. Can be operated manually without disturbing sequence.

SANGAMO ELECTRIC COMPANY • SPRINGFIELD, ILLINOIS

UMI

GREENLEE
PROFIT MAKERS
For The Electrical Contractor

THE greater the efficiency of the tools you use, the more chance you have of meeting competition and making a profit on each job. That is why Greenlee Conduit Benders and Knockout Tools are so popular. They cut costs on every job and are liked by the men who use them.

Hydraulic Conduit Benders

Greenlee Hydraulic Conduit Benders insure profits, because they bend conduit quicker and easier than by other methods. In addition, they make smooth, even bends, eliminating many fittings and making it easy to pull in wire and cable. They are easy to take to the job, too, because they are readily portable.

Knockout Tools

Greenlee Knockout Punches and Cutters are time savers and profit makers, because they make it easy to enlarge holes in switch boxes, cabinets, etc. They form clean-cut holes quickly and accurately, without any reaming or filing.

Other Tools

Hydraulic Pipe Pushers
Joist Borers — Bit Extensions
Electricians' Bits

Let us send complete information, without obligation to you. Just use the convenient coupon.

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS
Please send complete information on the following:
☐ Conduit Benders
☐ Knockout Tools
Name .....
Street .....
City .....
State .....
My Jobber is.....10-35

entitled to work anywhere in Michigan after having acquired a state certificate. These certificates are issued from a certain community, but can be registered in other communities by contractors for $1.00, and by journeyman for 50 cents.

A five-man administrative board, comprising a contractor, a municipal inspector, a utility representative, an underwriter's bureau representative, and an electrical worker representative are appointed by the governor for overlapping terms of office. Examination, revocations and suspensions of licenses are to be handled by this board, with the State fire marshal serving as an ex-officio member.

All electrical work as defined in this bill is to be subjected to inspection and with certain exceptions is to be installed by licensed contractors and journeymen. Certain utility plant and system work, ordinary repairs, and any work done under the supervision of any licensed operating engineer are exceptions from these provisions. The National Electric Code is recognized as a minimum standard for all state and/or municipal rules or regulations, except that reasonable trial installations may be permitted.

All municipal electrical contractor licenses that are now in force may run in force until their normal date of expiration, except that all contractors and journeymen must have state licenses on and after Jan. 1, 1937. Such municipal licenses as may expire in the interim may be renewed as state licenses for a period ending December 31 of that calendar year. After Jan. 1, 1937, there will be no further municipal licenses, but instead only the registration with various cities of the new state licenses for contractors and journeymen.

Standard Inspection Forms Developed by I.A.E.I.

A set of eight printed forms for use in the administration of electrical codes have been prepared by a committee of I.A.E.I. Their use is intended to ultimately become a standard I.A.E.I. recommendation to those who are organizing or revising inspection department procedure. After several years detailed study these eight forms are being submitted to chapters for comment and suggestion.

Fifth Model Electrical Ordinance Form Ready

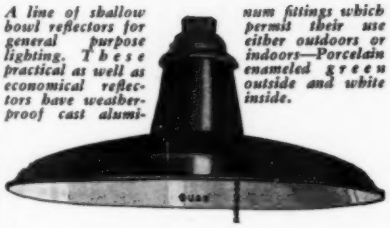
Based on a study of the ordinances of nearly seven hundred cities and towns and the accumulated experiences of a large number of electrical inspectors, the fifth edition of the Uniform Electrical Ordinance was recently released by the uniform legislation department of NEMA.

This is offered as a model form of electrical ordinance and seeks first to establish the National Electrical Code

QUAD
LIGHTING UNITS

BETTER *Modernization* CALLS FOR QUAD QUICK DETACHABLE REFLECTORS

A line of shallow bowl reflectors for general purpose lighting. These practical as well as economical reflectors have weatherproof cast aluminum fittings which permit their use either outdoors or indoors—Porcelain enameled green outside and white inside.



A better modernization job can be done with QUAD Quick Detachable Reflectors. These highly efficient lighting units will not only help you land many jobs through demonstration but will be the source of much repeat business.

Go after industrial modernization work—you'll find it profitable and easy to get with QUAD Quick Detachable Reflectors.

In addition, you'll find QUAD has a line of fittings which are interchangeable and permit the use of both shallow bowl and dome reflectors shown as well as other Q D Reflectors and globe holders—Reflector sizes range from 8 to 16 inches.

Write for full data on QUAD Reflectors.

The QUAD special dome reflector when combined with three different types of socket fittings provides a wide range of applications. Strongly constructed and weatherproof. Sockets easily wired and reflectors can be quickly attached and removed without disturbing wiring.

QUADRANGLE MANUFACTURING CO.
30 So. Peoria St. - - - - Chicago

A Channeluminum bus 1600 feet long

Build better and quote lower with ALCOA ALUMINUM BUS

The saving of at least 52% in weight by Alcoa Aluminum Bus gives you a real advantage in figuring the bus-structure. You can make real savings here, yet deliver a mechanically superior system. The reason is the extremely high strength-weight ratio of Aluminum Bus.

You save further on erection costs because Aluminum is so light to handle. Another saving comes from the easy workability of all Aluminum shapes, whether rolled channel sections, or flats, or tubes. And you have the option of bolted or welded joints. Either technique is easy, workmanlike, economical and permanent.

One outstanding advantage of Alcoa Aluminum Bus is resistance to corrosion from industrial fumes. Plating tank installations are a natural for Aluminum.

We would like to give you the complete story on Alcoa Aluminum Bus. It will help you get profitable business. ALUMINUM COMPANY OF AMERICA, 1897 Gulf Building, Pittsburgh, Pa.

ALCOA · ALUMINUM

UMI

There's an ELECTROLET for every outlet

When you are using Killark Electrolets you know there is nothing better in the way of conduit fittings. Everyone is perfect, without burrs, with smooth, clean cut threads, made of unbreakable malleable iron, plated with cadmium to prevent rusting and to provide a permanent bright finish.

There's a complete line of Electrolets, made in all the types required by electrical contractors. Use the line that's complete in every respect.

You'll find that Electrolets are profitable too. They are easier to assemble, save time on the job and satisfy your customers.

Specify Electrolets on every job.
Ask your jobber today.

KILLARK ELECTRIC MANUFACTURING CO.
3940 Easton Avenue,
ST. LOUIS - MISSOURI

KILLARK ST. LOUIS

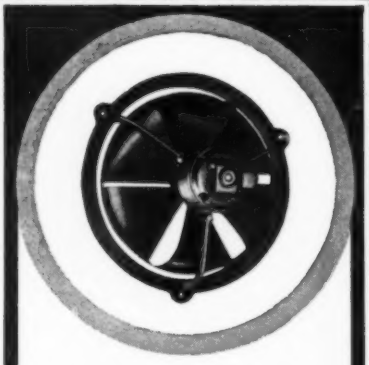
as the standard of practice, and second, to provide for enforcement of the Code through the creation of an inspection department and the adoption of the necessary administrative provisions.

Los Angeles Group Reorganized

Following a recent ballot of its members, the Los Angeles branch of the Southern California chapter of N.E.C.A. was reorganized and a new program adopted. J. J. Newett, formerly with the Doran Electric Company, of Los Angeles, has been engaged as secretary and manager with new headquarters in the Wilson Building, 132 West First Street. The Biddle Trade Bureau, which formerly operated the Los Angeles branch, is retained for legal needs and will continue to act as secretary for the Southern California Chapter. A. S. Stone is president of the Los Angeles branch and the directors are Herbert Evans, George DeAath, Max Frye, Fred Elbrick, James English and Charles Taylor.

An Outline of N.E.C. Purposes and Procedure

A 16-page booklet entitled "The National Electrical Code—A Description of its Purpose and the Manner in Which it Is Formulated," has just been issued by the International Association of Electrical Inspectors. This publication is designed to answer questions pertaining to the revision of the Code.



Ventilating Fans

If you are not installing Signal Vent Fans, investigate this popular line at once. The reason? Guaranteed quality at prices that return you a satisfactory profit. Here's a complete line that's easy to sell and stays sold. Bucket Blade and Flat Blade Fans, Automatic Shutters, Switches and kitchen fans, adjustable or built-in types. If your jobber cannot supply you write us.

SIGNAL ELECTRIC MFG. CO.
Menominee, Michigan, U. S. A.

OFFICES IN PRINCIPAL CITIES

SIGNAL

Be up-to-date with the new

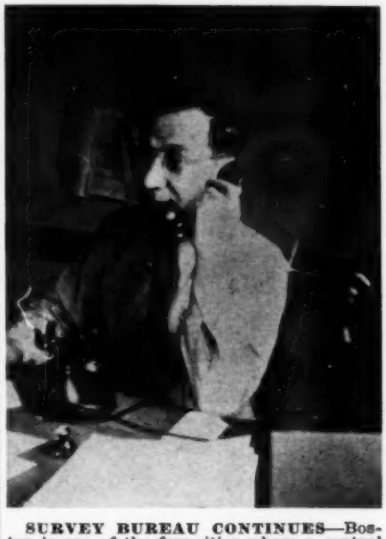
"VERIFIED" DIRECTORY of ELECTRICAL WHOLESALERS

1935 Edition

91% revised! Bound in durable leatherette. Next edition not ready until April, 1936.

Order from

The Electrical Trade Publishing Co.
330 W. 42nd St., New York City



SURVEY BUREAU CONTINUES—Boston is one of the few cities where a central survey bureau remains in operation. There the Electrical Estimating Bureau, Inc., has been kept in operation since 1929 and has served about forty contractors of the metropolitan Boston area. Albert R. Frank, treasurer of the bureau, was chairman of the L.A.C. of NRA, and C. L. Heckman, the bureau's manager, acted as regional field secretary under the Code. Mr. Frank is a former electrical contractor, and is at the present time a member of the executive board of the Greater Boston Electrical Contractors Association.

MANUFACTURED BY

AMERICAN STEEL & WIRE COMPANY

208 S. LA SALLE STREET, CHICAGO • • EMPIRE STATE BUILDING, NEW YORK

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Offices in All Principal Cities

Export Distributors: United States Steel Products Company, New York

United States Steel Corporation Subsidiary

SHERMAN

RIGID GROUND FITTINGS

This is GF7 Solderless Fitting for No. 8 and No. 6 Bare Armored or Unarmored Wire.

This Fitting embodies latest design for correctly installing No. 6 or No. 8 bare armored or unarmored ground wire. It may also be used with cables or cord. The special clamp firmly grips the armor or outer cable installation. Pipe clamp jaws are slotted so that the clamping screws need not be removed for installation. Pipe clamp may be reversed for use with ground rod.

Send for Trade Bulletin No. 12 describing complete line.

SOLD THRU JOBBERS

H. B. SHERMAN MFG. CO.
Battle Creek, Mich.

Specializing in

ALL THREAD CONDUIT

Made from Enameled Conduit. Standard sizes in stock—special to order.

GALVANIZED CONDUIT REDUCER

A very useful fitting. All sizes from 4x3½ to ½x¼ in.

Write for complete details and prices.

• GWILLIAM •
Manufacturing & Supply Corp.
4417 North Sixth St., Philadelphia, Pa.

SPECIFY

"Latrobe"

FLOOR BOXES—ACCESSORIES
"BULL DOG" INSULATOR SUPPORTS
"KEYSTONE" FISHWIRE
CONDUIT BENDERS

All manufactured by Fullman Mfg. Co. and carried in stock by over 300 jobbers—Send for Catalog No. 225.
FULLMAN MFG. CO. - LATROBE, PA.

A Roll o' Tape

Electrical Flashes gathered among the big wire and pipe men

by
Electrical Contracting's Field Editors

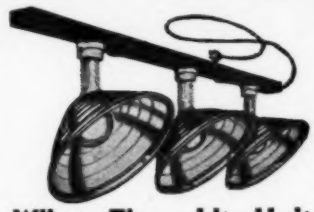
A FOOT candle meter reading taken over the surface of the drafting table of Scrimgeour Electric Company, Worcester, Mass., reads 46 to 50 f. c., and no glare or shadows. A good Better Light-Better Sight example right in the family.

AN average for eighty ranges done by Beardsley and Martin revealed this firm's cost as between $37.00 and $38.00 each. This covered a rigid conduit service armored cable range run, and armored grounding conductor to the street side of water meter.

PROFITABLE supply orders are received from local competitors by Jere, Woodring and Co., Hazleton, Pa., because this contracting firm does not try to get all the local wiring jobs. There being no wholesaling firm in that city, this arrangement permits other contractors to draw on their stock.

HAVING developed its machine shop business to a large volume, the New England Machine and Electric Company of Pawtucket, R. I., has provided a separate railed-off department for this machinery, and a desk for the foreman of this department. Electrical repairs are made in a department diagonally opposite from the machine shop.

MODERN industrial service shops should set an example to visiting customers by their own electrical equipment, believes Albert J. Daury of the Electrical Maintenance and Engineering Works, Woonsocket, R. I. Accordingly, their new plant is equipped with the latest types of individual motor drives, modern magnetic starting equipment, also remote push button and floor treadle operating stations. To carry



Wilson Three-Lite Unit

Includes
- 36 in. 3 socket wired strip; cord and plug.
- 3 Adjustable, 100-150 watt reflectors, 10" diam.
- Universal Mtg. brackets.
- 4 colors and holder.

Complete, ready to install. Reflectors adjustable to correctly light any depth of window.

$4.80 EA Net Price Lots, 2.

WILSON LIGHTING INC.
411-413 S. Clinton St., CHICAGO

LESS DRILLING and

More Powerful Anchorage are important factors on every job that requires the fastening of Electrical Equipment to concrete or masonry—You get these advantages with

CHICAGO

EXPANSION NUTS
(Machine Screw Anchors)
made in all sizes, long, short, and closed end.

Setting tools with every order.

SEND FOR FREE SAMPLES AND ATTRACTIVE PRICES.

CHICAGO EXPANSION BOLT CO.
128 S. Clinton St. Chicago, U. S. A.

To Cut Thin-Wall Conduit SQUARE Use the Beaver Square-End Sawing Vise

No. 2
¼ to 2"
$5.00

No. 4
1½ to 4"
$15.00

No. 2 is aluminum; No. 4 malleable iron. Both are self-contained—and simple to use with a standard hack saw. Renewable inserts. Through your jobber. Write us for complete catalog.

Beaver Pipe Tools, Inc., Warren, Ohio

"Standardize on
STANDARD
Transformers"

ALL TYPES
Indoor and Outdoor Service

Send for Descriptive Bulletin

STANDARD TRANSFORMER CO.
Warren - - - - - - - Ohio

out their constant plea with industrials for flexibility and adequacy for taking care of future power needs, a neat installation of patented wireway has been provided in the shop area. This runs along the ceiling from the distribution panel to the extreme end of the shop.

ATTRACTIVE advertising blotters are sent out each month by the H. N. Crowder Jr., Co., Allentown, Pa. Each month's mailing covers a different message, featuring various departments in this industrial contracting and supply organization.

A GOOD job that sold another for the H. N. Crowder Jr., Co. of Allentown, Pa., involved the use of messenger cables stretched under a trussed-roof textile plant for supporting conduit lighting outlets at exact locations.

THE contractor-dealer who maintains a well lighted electrical appliance display foots a lighting bill of from $25 to $50 per month, although he is actually an agent of the power company in building a long-haul load, says George W. Richardson of the Lancaster Electric Supply and Construction Co., Lancaster, Pa.

THE Warren & Bigelow Company of Worcester, Mass., believes in advertising its modern service shop to the trade. Quarterly calendar service is being resumed, blotters are distributed as stuffers, and a handsome letter-size brochure folder was recently prepared. The latter piece has space on the face for correspondence. When unfolded there are fourteen illustrations of the shop with captions. The reverse side is also handsomely illustrated.

COMMERCIAL lighting sales efforts are not to be based solely on the sales volume represented in lighting units alone. The contractor who properly stresses the economic factor of variable intensity filament lamps in such sales thereby creates some good wiring business. Flanagan Electric, Inc., Trenton, N. J., recently changed a small store to modern illumination values, and provided for panel control of the various filament circuits. Additional wiring resulted.

THE specialty of lawn and house party illumination has become a major item with Scannevin & Potter of Providence and Newport, R. I., since beginning business in 1892. Many of these jobs are said to run from $500 to $3,000, and require the men to travel considerable distances along the exclusive shore front, also to Long Island and Westchester County, New York. A recent rush of six parties over a period of eight nights included the lighting of a driveway one mile long. W. A. Bur-

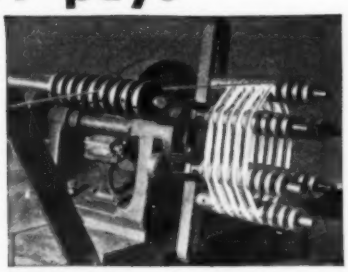
STEELDUCT
CONDUIT
THE STEELDUCT CO.
UNDERWRITERS LABORATORIES
No. SD RO-1
INSPECTED CONDUIT
YOUNGSTOWN, OHIO
Consider the THREADS of
STEELDUCT HOT-DIP
GALVANIZED CONDUIT
Threads present two problems. First, they must be cut with absolute accuracy, and smoothly finished. Second, these threads must be protected so that they arrive on the job in the same condition as they left the factory.
The threads on STEELDUCT Hot-Dip Galvanized Conduit are clearly and accurately cut, then protected with a smooth zinc coating. Before shipping, every length is protected with cardboard and metal. Thus you are assured of ease of installation and a perfect joint under all conditions.
For easy bending and fishing, and perfect quality throughout, install Steelduct on your next job.
SD
The STEELDUCT Co.
YOUNGSTOWN, OHIO

The Badger
50 Amp.
SYNCHRONOUS TIME SWITCH

A thoroughly reliable, high quality time switch that will give many years of dependable service.
The result of over 26 years of exclusive time switch manufacture, this product offers the latest in design and construction.
Approved by the Underwriters' Laboratories and fully guaranteed by the manufacturer.
See your wholesaler or write for complete descriptive literature.

RELIANCE AUTOMATIC LIGHTING CO.
1937 Mead St. Racine, Wis.

IT pays



IDEAL
COIL WINDING HEAD

Adjustable, universal type. Fits any turning device or lathe. It is a time-saving tool for high speed work and expert results. Winds Field, Mush, Armature, Transformer, Motor Coils and Loops with diamond, round, square or rectangular cores . . . . Takes only 3 minutes to set up . . . . Winds 40 to 60 mush coils per hour . . . . Winds complete sets up to 8 coils, eliminating soldering . . . . Has no side walls, coils can be laced on the head. If you are winding coils—try this money-saving tool that PAYS. Sent on free trial.

IDEAL COMMUTATOR DRESSER CO.
1041 Park Ave. Sycamore, Ill.

bridge, engineer and estimator for the firm vouches for the company's ability to furnish experienced workmen for such jobs, claiming that several men have been on the payroll thirty-five years, while he is but a junior, having been with the company only thirty-four years.

THE foreman of the H. N. Crowder Jr., Co., Allentown, Pa., meets motor repair customers within a private office away from the shop mechanics. This arrangement prevents the disturbance of workmen by curious visitors and also permits the foreman to gain the customer's undivided attention away from all disturbances.

SLOPPY WIRING comes high where habitual Code violators must correct their rural work under the jurisdiction of N. E. Cannady, electrical engineer of the North Carolina State Insurance department. The return inspection trip at automobile mileage to the job is a deterrent to wilful negligence, sloppiness or chiseling.

NATIONAL Sign Week may have meant just another "week" for some electrical men, but for Joseph Rotondo of Easton, Pa., it meant an opportunity to show the homefolks what could be done with gaseous tube lighting. A large wall board frame bearing a likeness of the president, and decorated in gay colors, was bordered with various colored tubes. This made the front of Rotondo's shop an interesting and novel display which didn't do his contracting and repair business any harm.

HEAVILY coppered subway feeders are claimed to subject defective 550-volt motor windings to surge currents as high as 40,000 amps., and 2,500 volts, for short periods before protective devices can function. This in the opinion of W. E. Haeseler, Berks Engineering Co., Reading, Pa., justifies extreme care in building special coils for reconditioning such equipment.

OUTSTANDING among successful business men who began in the early days, we find John P. Coghlin, of Worcester, Mass. Starting with a motor service shop in the early '90's, this pioneer is active today as president of both the Coghlin Electric Company, local wholesaling organization, and Coghlin's, Inc., a large retailing establishment which houses elaborately equipped departments on several floors. Here we find refrigeration, oil burning equipment, lighting equipment, small appliances, non-electrical furnishings, and rare gifts, all arranged into special sales departments. A local contracting department is also operated by Coghlin's, Inc. Two sons, Edwin B., and John W. Coghlin, are active in the two firms.

MINERALLAC
Cable or Conduit Hanger
Jiffy Clip
Now furnished in EVERDUR as well as Cadmium Plated Steel.

Cable or Conduit Hanger
Rigid Conduit—⅜"—2½"
Thin Wall—½"—1½"

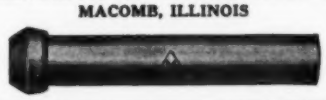
Jiffy Clip—Rigid Conduit
⅛"—1¼". Also B X Cable

Ask your Jobber

MINERALLAC ELECTRIC CO.
25 No. Peoria Street, Chicago, Ill.

New York City Branch
381 Fourth Avenue

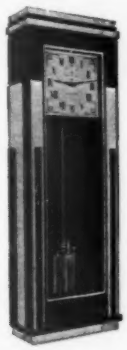
For
Residence Wiring
The Best and Safest Method is a properly installed KNOB and TUBE job. Be sure and get the
TRADE MARK Bull Dog REGISTERED
Assembled Knob because it "HAS A GRIP LIKE ITS NAMESAKE."
ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS



New Products . for October . .

Clock System

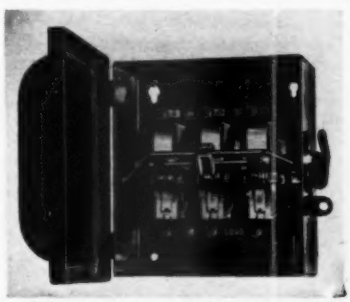
A line of electric clock systems for schools, hospitals, banks and public buildings. A spring driven, electrically



wound mechanism is used in the master clock, utilizing a pendulum claimed to be the most accurate escapement control yet discovered. This spring drive insures continued timekeeping during an interruption of current lasting. Secondary clocks are corrected each hour by the master clock, whether running fast or slow. Smooth, silent operation and long life are claimed for these clocks. Holtzer-Cabot Electric Co., Boston, Mass.

Electromagnetic Circuit Breaker

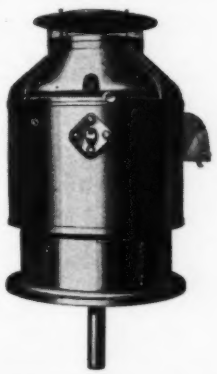
A line of one, two and three pole circuit breakers from ½ to 35 amps., 250 volts, a.c., which have electromagnetic overload mechanisms. Known as "Re-Cirk-It," they are trip-free and their tripping point is claimed to be



practically unaffected by ambient temperature. Time delay is controlled by a hermetically sealed unit. Units may be obtained embodying time current curves to match particular circuit characteristics. The magnetic trip time delay is said to give delayed trip on overload and high speed trip on short circuits. Units are available in steel boxes and enclosed in bakelite housings, with or without time delay. Shunt trip coils can be supplied for remote opening. Heinemann Electric Co., Trenton, N. J.

Vertical Slip Ring Motor

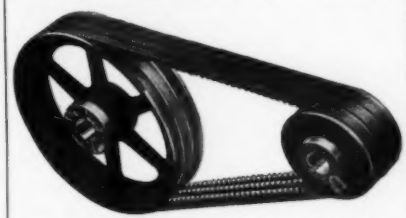
A line of enclosed fan-cooled vertical motors for heavy service such as centrifugal sewage pumps, cement mills, garbage and fertilizer plants, etc. Through a departure from conventional design the cooling fan has been located on the shaft extension at the top, opposite the driving end. Slip rings are at the bottom end, provided with dust tight covers and a free outlet for cooling air. A mushroom type cover with heavy mesh wire side screens protects the vertical intake



against dripping water. Steel lifting bails are provided on opposite sides for motor handling. A 75 h.p., 690 r.p.m., 3 ph. motor is illustrated. Harnischfeger Corporation, Milwaukee, Wis.

Cast-Machined Pulleys

A line of "Day-Steel" pulleys of cast-machined (semi-steel) construction for Dayton cog-belt drives up to 15 h.p.



Excess metal has been eliminated until the weight is approximately the same as the pressed steel pulley, although maximum strength is claimed. Precision machined surfaces of exceptionally smooth and close grained grooves, and accurately balanced true-running drives are said to result from this process. The Dayton Rubber Manufacturing Co., Dayton, Ohio.

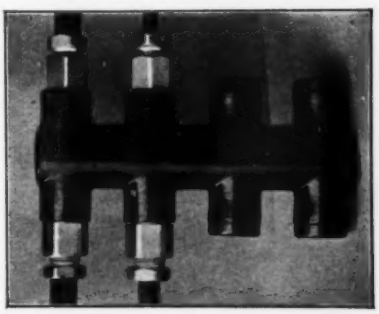
Range Switch

A line of 60-amp. range switches which have swing-out interiors to facilitate making wiring connections. When in a normal position these units

have the appearance of conventional range panels, but by loosening two screws the interior can be swung out to make all of the box area available for installing conduit and wire connections. Dead front pullers are provided for the cartridge fuses. Fuse jaws are recessed below the surface of the block to prevent accidental contact with live parts. Fuse heating is said to be prevented through a one-piece fuse clip and contact blade. Square D Co., Detroit, Mich.

Multiple Connector

An insulated body providing solderless cable connectors for making multiple joints in various arrangements of cables in underground secondary dis-



tribution systems. Underground cable moles are claimed to provide an effective stop joint on oil-impregnated cable, without requiring a stub joint, and are said to be advantageous for making connections between rubber, rubber and lead covered cables to paper-insulated, oil-impregnated cables. Each connector will accommodate a range of cable sizes. Burndy Engineering Co., Inc., New York, N. Y.

Neon-Sign Cable

A 15-kilovolt weatherproof neon-

UMI

IRWIN
Electrician Bits
SPECIAL OFFER - Only
59¢
NEVER BEFORE HAVE THESE HIGH QUALITY BITS BEEN SOLD AT THIS LOW PRICE. . . . . .

It's the same speed boring, durable Bit that Irwin has always made to meet specifications of Electricians all over the country.

Special Bit steel, heat treated all over for long life and hard usage, deep cut screw point with durable cutter for fast boring and finished in our new golden bronze color. Supplied in the standard 11/16" size, 10" over all.

Buy Now and Save

Insist that your dealer or jobber supply you with Irwin Golden Anniversary Electrician Bits.

The Irwin Auger Bit Co.
Wilmington, Ohio

BURNDY
QIKTAP

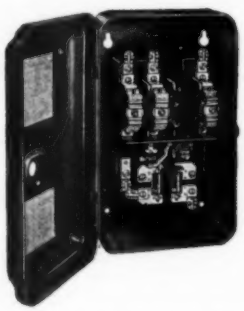
Installed in a minute with only a wrench

BURNDY
ENGINEERING CO., INC.
305 EAST 45TH STREET, NEW YORK
Representatives in Principal Cities

ign cable, which has a smaller diameter than the older type, is claimed to provide savings in the time required to wire signs, savings in space, and in the size of glass tubing in window signs. General Electric Co., Schenectady, N. Y.

Magnetic Motor Starter

Type "MS" magnetic motor starting switches are made for local control up to 7½ h.p., and for remote control up to 25 h.p. in a.c. motors of 25, 50 or 60 cycles. An accurately built mechanism, capable of withstanding rough handling



in shops or mills is claimed. Each pole is broken at two points and has self-adjusting contacts that are kept clean because of a wiping motion as they seat. Thermal relay heaters react under sustained overload upon a bimetallic thermostat which trips the switch. The switching mechanism is mounted on bakelite and may be mounted on a panel without the cabinet and with no further insulation. Hand reset, overload and undervoltage protection or release features are provided. Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.

Tumbler Switch

An enclosed bakelite tumbler switch employing floating contacts for controlling high-intensity type C lamp loads. This No. 1531 switch is rated 10 amps. 125 V. in the single pole and three way types, and is also made in double pole and four

way and locking styles. Moving contacts are said to operate to automatically adjust themselves to the correct position and tension. Arc snuffers are provided on both sides and between moving contacts to cool and quench any arc before it can damage the contacts or reach the base. Arrow-Hart & Hegeman Electric Co., Hartford, Conn.

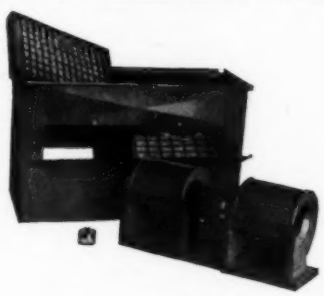
Industrial Analyzer

A light weight and compact testing unit for three phase motors; various a.c. circuits and appliance tests; plant layout,

analysis and efficiency tests. It is claimed to do the work ordinarily performed by an ammeter, voltmeter, polyphase watt meter, power factor meter, four current transformers, and a voltage transformer. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Furnace Blower

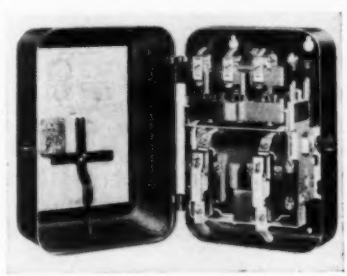
The Emerson No. 14 furnace blower is designed for use with warm air heating systems in average five or six room houses. It is a direct-drive unit complete with filter cabinet, dustop filters and two-speed switch. Positive air circulation, together with filtration makes this blower available for summer use also in circulating cool air from the basement to other rooms in the home. Because of direct-drive resilient rubber mountings



this unit is claimed to be quiet in operation, vibrationless and highly efficient. The Emerson Electric Mfg. Co., St. Louis, Mo.

Motor Starter

An across-the-line motor starter for general purpose installations, furnished for push button (remote) control. Designated as type A-32, it is rated 25 h.p. at 440 and 550 V., 15 h.p. at 220 V., and 7½ h.p. at 110 V. Temperature overload relay is designed on the melting alloy principle, for which greater accuracy is claimed because of total relay enclosure in a moulded case. Extra heavy silver contacts; vertical make and break; short-stroke mechanism; multi-break arc pre-



vention, and sturdy compact construction are further claims. Condit Electrical Mfg. Co., Boston, Mass.

Manufacturers' Bulletins . . .

Bearing Lubrication: Care of ball bearings, the Ten Ball Bearing Commandments, and pointers on sleeve bearings are covered in "Lubrication of Bearings in Electrical Machinery," a one-page sheet, Form 606. The Imperial Electric Co., Akron, O.

Pole Anchoring: "Correct Anchoring" provides 24 pages devoted exclusively to methods and devices for guying and anchoring with the use of expanding, screw, cone and plate types of anchors. Tables for figuring guy strains, and explanations of twelve types of guys are included. Chance Co., Centralia, Mo.

Control Products: September issue of the "Square D Digest," a thrice-yearly publication contains current prices, new developments, reference data and general information regarding the Square D line. Forty-four pages. Square D Company, Detroit, Mich.

Window Controls: A promotional presentation of "Mark-Time" switches including direct mail pieces and novelties. A 16-page brochure, "This is only interesting," presents to merchants in lay terms the advantages to be derived from various types of adjustable "Mark-Time" devices. M. H. Rhodes, Inc., New York, N. Y.

Phenolic Insulation: The varied uses and properties of Dilecto (phenol fibre) laminated products in sheets, rods, tubes, fabricated parts and moldings, with suggestions for machinery, shearing, sawing, punching, drilling, tapping or threading this synthetic resinous material. Other products briefly covered are Micabond, Diamond Fibre, Codite, Vulcoid, Celoron silent gears, and Cellulak tubes. Continental-Diamond Fibre Co., Newark, Del.

Motor Maintenance Equipment: A 64-page catalog and reference book covers commutator and slip ring resurfacers; portable and bracket type precision grinders; hand and power under cutters; power cleaners; commutator slotting and scraping tools; electric drills; coil winding heads; wire strippers; joist boring machines; growlers; also fuse pullers and test lights. Other specialties include fuse clamps; fuse reducers; solderless connectors; cleaning and penetrating fluids; gasket and commutator cements; industrial thermometers. Eighteen pages are devoted to hints on commutator care; commutator troubles and remedies; operation of d.c. generators; definitions of 59 electrical terms; and a liberal space containing tables, data and electrical formulae. Catalog No. H535. Ideal Commutator Dresser Co., Sycamore, Ill.

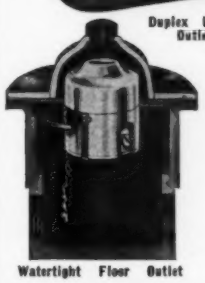
Graybar

EXECUTIVE OFFICES, GRAYBAR BLDG., NEW YORK

Victor [Friction and Rubber] and Sticka Tapes also Distributed and Guaranteed by Graybar

Single Utility Outlet

Duplex Utility Outlet


Watertight Floor Outlet

Build up prestige and good will by installing quality materials in all your jobs.

STEEL CITY PRODUCTS

help the electrical contractor gain a reputation, not only for furnishing quality products but workmanship as well, because they are manufactured in accordance with the workman's needs, insuring speedy, dependable performance at all times.

We manufacture a complete line of outlet boxes, covers, switch boxes, conduit fittings and electrical specialties, furnished in sherardized, galvanized, enameled or cadmium finish.

WRITE FOR OUR NEW CATALOGUE

STEEL CITY ELECTRIC CO.
PITTSBURGH, PENNA.

Gentlemen:

Please send a copy of your new catalogue to

Name .....

Address .....

.....

MULTI

REFLECTORS

The "MULTI" 2-piece dome industrial fixture has a white diffusing glass globe with an all white reflector. The glass globe is held by a "MULTI" "Gripit" holder with internal finger support. No possible breakage from vibration or expansion.

BUSHINGS

When a special condition arises either in wiring installations or in production equipment you can count on Multi Bushings having one in its large line to meet the particular requirement. Ask for Multi Bushings or write us direct for catalog sheets or samples.

SEND FOR A COMPLETE CATALOG OF MULTI PRODUCTS

MULTI ELECTRICAL MFG. CO.
1840 W. 14th St. Chicago, Ill.

Go after Industrial Repairs with

MICABOND INSULATION

Micabond is mica in its most usable form—combining the desirable qualities of raw mica with adaptability to meet a great variety of insulating needs. Use it—to lower labor costs and improve quality of repair work. We shall be glad to send you samples of Mica, Tape, Paper, Tubes or Plate.

CONTINENTAL-DIAMOND FIBRE COMPANY
NEWARK, DELAWARE
CHICAGO
CLEVELAND
NEW YORK

Advertisers' Index

A

Aluminum Co. of America..... 43
American Steel & Wire Co..... 45
Appleton Electric Co..... 23
Arrow-Hart & Hegeman Electric Co., The 25

B

Beaver Pipe Tools, Inc..... 46
Bryant Electric Co..... 29
Burndy Engineering Co., Inc..... 50
Bussmann Manufacturing Co.....26, 27

C

Chase-Shawmut Co., The..... 34
Chicago Expansion Bolt Co..... 46
Colt's Patent Fire Arms Mfg. Co.... 30
Continental-Diamond Fibre Co..... 52
Crescent Insulated Wire & Cable Co. 34
Cutler-Hammer, Inc. 21

F

Fairbanks, Morse & Co..... 35
Fullman Mfg. Co..... 46

G

General Electric Co.
Inside Front Cover, Back Cover
Graybar Electric Co.....4, 51
Greenlee Tool Co..... 42
Gwilliam Mfg. & Supply Corp..... 46

H

Henderson-Hazel Corp. 36, 37

I

Ideal Commutator Dresser Co..... 48
Illinois Electric Porcelain Co..... 48
Irwin Auger Bit Co..... 50

J

Jefferson Electric Co..... 33

K

Killark Electric Mfg. Co..... 44

M

McGill Manufacturing Co..... 32
Minerallac Electric Co..... 48
Multi Electrical Mfg. Co..... 52

O

Ohio Carbon Co..... 32

P

Plymouth Rubber Co..... 31

Q

Quadrangle Manufacturing Co..... 42

R

Reliance Automatic Lighting..... 48

S

Sangamo Electric Co..... 41
Sherman Mfg. Co., H. B..... 46
Signal Electric Mfg. Co..... 44
Square D Company...Inside Back Cover
Standard Transformer Co..... 46
Steel City Electric Co..... 51
Steelduct Co. 47

U

United States Rubber Co.....2, 24

V

Victor Electric Products, Inc..... 52

W

Wilson Lighting, Inc..... 46
Wiremold Co., The..... 22
Wolverine Tube Co..... 52

BETTER SOLDERING LUGS

Wolverine Lugs are made from the best electrolytic copper of high conductivity and are processed under the complete control of Wolverine Engineers.

The Square End Design offers greater contact area and increases the current carrying capacity of the lug.

For greater safety use Wolverine Lugs

WOLVERINE TUBE COMPANY
1441 Central Ave. Detroit, Mich.
STOCKS IN ALL PRINCIPAL CITIES

This Kitchen Ventilator Has Everything You Want!

THE VICTOR IN-BILT

Automatic Operation

3-Speed Control

For Both New and Old Homes!

HERE are just a few of the features this Victor Ventilator offers: Full 12" fan—powerful induction type motor—weather-tight shutters—beautiful interior grille hinged for easy access to clean blades—beaded chain controls both shutters and fan—special 3-speed switch. And—a surprisingly low price!

Easy Installation!

Designed to make your work easy—has tubular wall sleeve adjustable to any thickness. Wiring connections simplified—no chance for trouble. Can be easily installed in both new or old homes—any type of construction. Send today for complete literature and installation details.

Victor Force Air Exhaust Fans!

Be sure to get acquainted immediately with the Force Air Line. A powerful fan for every purpose and at a price that will delight you. Better performance and lasting satisfaction guaranteed! Ask for literature and prices today!

VICTOR ELECTRIC PRODUCTS, Inc.
728 Reading Road Cincinnati, Ohio

INDUSTRIAL CIRCUIT BREAKER

with Swing-Out Interior and Complete Interlock

This new industrial circuit breaker has the Swing-Out Interior—an exclusive Square D feature—and the elevated base which permits easy wiring without skinning the knuckles.

It has a complete interlock, too, making it impossible to open the door when the breaker is on or operating the breaker when the door is open, unless the interlock is purposely disabled. A shield over the line contacts prevents accidental contact with live parts.

This new breaker is externally operated and the operating handle is permanently engaged with the breaker handle, so that there is no danger of breakage when the cover is being closed. This is a Square D feature.

The "on," "off" and "trip" positions are clearly indicated and there is provision for a pilot light, if required. The cabinet is semi dust-proof with a felt gasket crimped—not glued—into the cover.

Square D Swing-Out Interior Circuit Breakers are available in 2 and 3 poles, from 15 to 50 amperes, with two voltage ratings: 230 Volts A. C., 125-250 Volts D. C. and 575 Volts A. C., 250 Volts D. C. Other types of circuit breakers are available up to 600 amperes.

Here is a circuit breaker which appeals equally to the industrial engineer and to the wiring electrician.

CALL IN
A SQUARE D MAN

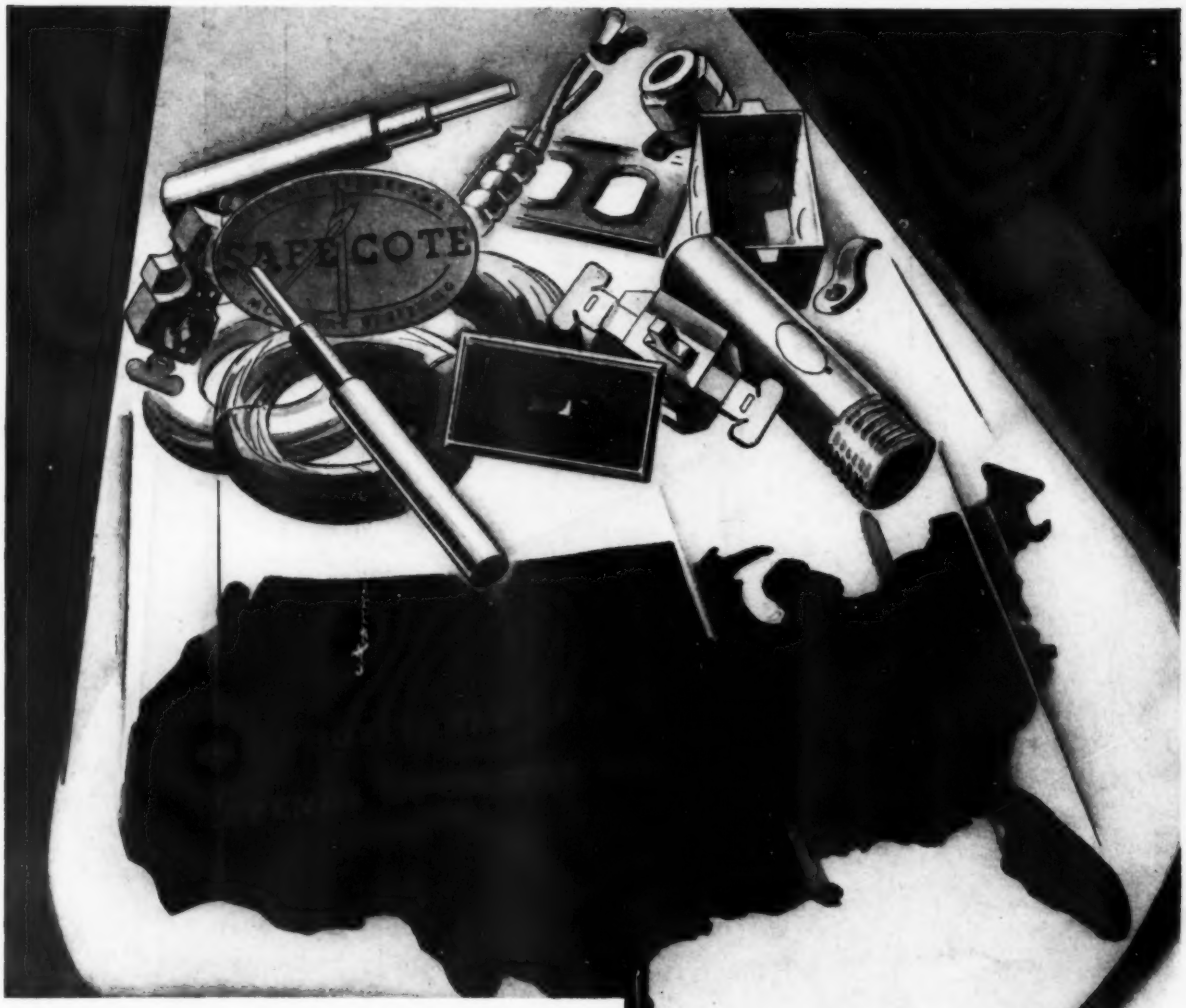
SQUARE D COMPANY

DETROIT MICHIGAN U.S.A. MILWAUKEE WISCONSIN

SQUARE D COMPANY, INC., LOS ANGELES, CALIFORNIA
SQUARE D COMPANY CANADA LTD. TORONTO, ONTARIO

CALL IN
A SQUARE D MAN

UMI



TO successfully "Rewire America", electrical contractors must use the highest-quality wiring materials. Homes, office buildings and factories must be wired to provide maximum electrical convenience, safety, economy. Use G-E Wiring Materials exclusively to get and HOLD that business . . . TO MAKE LARGER PROFITS.

G-E "Safecote" Building Wire, Rigid Conduit, BX Armored Cable, Switches and Convenience Outlets are durable, dependable, economical. They are easy to install. The Line is complete . . . available everywhere. For full information, write Section CDW-4810, Merchandise Dept., General Electric Company, Bridgeport, Conn.

GENERAL ELECTRIC

WIRING MATERIALS

UMI